

MXD-D40

SERVICE MANUAL

Ver 1.0 2001.03



Photo: Gold type

US Model
Canadian Model
AEP Model
UK Model
E Model

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

MD Section	Model Name Using Similar Mechanism	MXD-D5C
	MD Mechanism Type	MDM-7X2A
	Optical Pick-up Name	KMS-262A
CD Section	Model Name Using Similar Mechanism	MXD-D4
	CD Mechanism Type	CDM55B-21BD53
	Base Unit Name	BU-21BD53
	Optical Pick-up Name	OP Assy (A-MAX.2)

SPECIFICATIONS

CD player section

System	Compact Disc digital audio system
Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Less than $44.6 \mu\text{W}^*$ * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Frequency response	5 to 20,000 Hz $\pm 0.5 \text{ dB}$
Signal-to-noise ratio	More than 98 dB
Wow and flutter	Below measurable limit

MD deck section

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Less than $44.6 \mu\text{W}^*$ * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Laser diode properties	Material: GaAlAs
Revolutions (CLV)	800 rpm to 1,800 rpm

Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency	44.1 kHz
Coding	Adaptive Transform Acoustic Coding (ATRAC)/ATRAC 3
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz $\pm 0.5 \text{ dB}$
Signal-to-noise ratio	Over 98 dB during playback
Wow and flutter	Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Minimum input
ANALOG IN	Phono jacks	47 kilohms	500 mVrms	125 mVrms
DIGITAL OPTICAL IN	Square optical connector jack	Optical wave length: 660 nm	—	—

— Continued on next page —

COMPACT DISC MINIDISC DECK

SONY®

Outputs

	Jack type	Rated output	Load impedance
PHONES	Stereo phone jack	10 mW	32 ohms
ANALOG OUT	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms

General

Power requirements

Where purchased	Power requirements
U.S.A. and Canada	120 V AC, 60 Hz
Europe	220 - 230 V AC, 50/60 Hz
Certain countries in Asia	220 - 240 V AC, 50/60 Hz
Other countries	110 - 120 or 220 - 240 V AC selectable, 50/60 Hz

Power consumption 22 W (less than 1 W at standby)

Dimensions (approx.) (w/h/d) incl. projecting parts and controls
430 × 120 × 290 mm

Mass (approx.) 4.7 kg

Supplied accessories

- Audio connecting cords (2)
- Remote commander (remote) (1)
- Sony R6 (size-AA) batteries (2)
- Power plug adaptor (1) (Singaporian model only)

Design and specifications are subject to change without notice.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SELF-DIAGNOSIS FUNCTION

The self-diagnosis function consists of error codes for customers which are displayed automatically when errors occur, and error codes which show the error history in the test mode during servicing. For details on how to view error codes for the customer, refer to the following box in the instruction manual. For details on how to check error codes during servicing, refer to the following “Procedure for using the Self-Diagnosis Function (Error History Display Mode)”.

Self-Diagnosis Function

The deck has a self-diagnosis display. This function shows a three- or five-digit display (a combination of a letter and figures) and the corresponding message, so you can check the deck's condition.

If such a display appears, check the following table in order to resolve the problem.

Should any problem persist, consult your nearest Sony dealer.

Three- or five-digit display/Message	Cause/Remedy
C11/Protected	The inserted MD is record-protected. ➔ Take out the MD, and close the record-protect tab.
C12/Cannot Copy	An attempt was made to play a disc that is not compatible with this deck (CD-ROM, MD data disc, etc.). ➔ Replace the disc.
C13/REC Error	The recording was not made properly. ➔ Set the deck in a stable place, and repeat the recording procedure. The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or not up to standards. ➔ Replace the disc, and repeat the recording procedure.
C13/Read Error	The deck could not read the TOC of the MD properly. ➔ Eject the disc, then insert it again.
C14/TOC Error	The deck could not read the TOC of the MD properly. ➔ Insert another disc. ➔ If possible, erase all tracks on the MD using the All Erase Function.
C41/Cannot Copy	The digitally dubbed material cannot be recorded digitally.
C71/Din Unlock	A moment's lighting is due to the signals of the digital program being recorded. This does not affect the recorded material. While recording from a digital component connected through the DIGITAL OPTICAL IN connector, the digital connecting cable was unplugged or the digital component turned off. ➔ Connect the cable or turn the digital component back on.
E0001/MEMORY NG	There is an error in the internal data that the deck needs in order to operate. ➔ Consult your nearest Sony dealer.
E0101/LASER NG	There is a problem with the optical pick-up. ➔ The optical pick-up may have failed. Consult your nearest Sony dealer.

PROCEDURE FOR USING THE SELF-DIAGNOSIS FUNCTION (ERROR HISTORY DISPLAY MODE)

Note: Perform the self-diagnosis function in the “error history display mode” in the test mode. The following describes the least required procedure. Be careful not to enter other modes by mistake. If you set other modes accidentally, press the **MENU/NO** button to exit the mode.

1. Press the **■** (CD), **■** (MD) and **YES** buttons at the same time.
2. Press the **◀◀ AMS ▶▶** (MD) knob and **■** (MD) button to display “<To Normal> 0”.
3. Turn the **◀◀ AMS ▶▶** (MD) knob and when “<MD Test> 5” is displayed, press the **◀◀ AMS ▶▶** (MD) knob.
4. Turn the **◀◀ AMS ▶▶** (MD) knob and when “[Service]” is displayed, press the **YES** button.
5. Turn the **◀◀ AMS ▶▶** (MD) knob to display “Err Display”.
6. Press the **YES** button to set the error history mode and displays “op rec tm”.
7. Select the contents to be displayed or executed using the **◀◀ AMS ▶▶** (MD) knob.
8. Press the **◀◀ AMS ▶▶** (MD) knob to display or execute the contents selected.
9. Press the **◀◀ AMS ▶▶** (MD) knob another time returns to step 6.
10. Press the **MENU/NO** button to display “Err Display” and release the error history mode.
11. To release the test mode, press the **I/O** button to display “<MD Test> 5”.
12. To turn the power OFF, turn the **◀◀ AMS ▶▶** (MD) knob and when “<Initial> 8” displayed, press the **◀◀ AMS ▶▶** (MD) knob.

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

Selecting the Test Mode

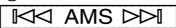
Display	Details of History
op rec tm	Cumulative recording time is displayed. When cumulative recording time is over 1 minute, the hour and minute are displayed as they are. When it is under 1 minute, "Under 1 min" is displayed. The displayed time shows how long the laser is in high power state. It is about one fourth the actual recording time.
op play tm	Cumulative playing time is displayed. When cumulative playing time is over 1 minute, the hour and minute are displayed as they are. When it is under 1 minute, "Under 1 min" is displayed.
spdl rp tm	Cumulative spindle motor running time is displayed. When cumulative spindle motor run time is over 1 minute, the hour and minute are displayed as they are. When it is under 1 minute, "Under 1 min" is displayed.
retry err	Displays the total number of retries during recording and number of retry errors during play. Displayed as "r□□ p□□". "r" indicates the retries during recording while "p" indicates the retry errors during play. The number of retries and retry errors are displayed in hexadecimal digits from 00 to FF.
total err	Displays the total number of errors. Displayed as "total □□". The number of errors is displayed in hexadecimal digits from 00 to FF.
err history	Displays the 10 latest errors. Displayed as "0□ ErrCd@@". □ indicates the history number. The smaller the number, the more recent is the error. (00 is the latest). @@ indicates the error code. Refer to the following table for the details. The error history can be switched by turning the  (MD) knob.
retry adrs	Displays the past five retry addresses. Displays "□□ ADRS □□□□", □□ is the history number, □□□□ is the cluster with the retry error. Select the error history number using the  knob.
er refresh	Mode to clear the error history and retry address history. [Operating method] 1) Press  (MD) knob when "er refresh" is displayed. 2) The display will change to "er refresh?", and then press [YES] button. The operation is over if "Complete!" is displayed. After this mode was executed, check the following: • The data have been cleared. • Perform the recording and playing to check that the mechanism operates normally.
tm refresh	Mode to clear the "op rec tm" and "op play tm" histories. These histories serve as approximate indications of when to replace the optical pick-up. If the optical pick-up has been replaced, perform this operation and clear the history. [Operating method] 1) Press  (MD) knob when "tm refresh" is displayed. 2) The display will change to "tm refresh?", and then press [YES] button. The operation is over if "Complete!" is displayed. After this mode was executed, check the following: • The data have been cleared. • Perform the recording and playing to check that the mechanism operates normally.
op change	Mode to clear cumulative time of "op rec tm" and "op play tm". These historical data are used to determine the timing when the optical pick-up is to be replaced. When the optical pick-up was replaced, perform this operation to clear historical data. [Operating method] 1) Press  (MD) knob when "op change" is displayed. 2) The display will change to "op chang?", and then press [YES] button. The operation is over if "Complete!" is displayed.
spdl change	Mode to clear cumulative time of "spdl rp tm". This historical data is used to determine the timing when the spindle motor is to be replaced. When the spindle motor was replaced, perform this operation to clear historical data. [Operating method] 1) Press  (MD) knob when "spdl change" is displayed. 2) The display will change to "spdl chang?", and then press [YES] button. The operation is over if "Complete!" is displayed.

Table of Error Codes

Error Code	Details of Error
10	Loading failed
12	Loading switch combination is illegal
20	Head of PTOC could not be read within the specified time
21	Head of PTOC could be read but its content is erroneous
22	Access to UTOC could not be made within the specified time
23	UTOC could be not read within the specified 3time
24	Content of UTOC is erroneous
30	Playing could not start
31	Content of sector is erroneous
40	Cause of retry occurred during normal recording
41	D-RAM overflowed and retry was executed
42	Retry was executed during the writing to TOC
43	S.F editing was interrupted by retry
50	Address could not be read except in access processing
51	Focusing failed and it is out of control
60	Unlock retry

TABLE OF CONTENTS

SELF-DIAGNOSIS FUNCTION	3	6-22. Printed Wiring Board – HP Board –	70
1. SERVICING NOTES	8	6-23. Schematic Diagram – HP Board –	70
2. GENERAL	18	6-24. IC Pin Function Description	72
3. DISASSEMBLY		7. EXPLODED VIEWS	
3-1. Disassembly Flow	19	7-1. Case Section	82
3-2. Loading Panel	20	7-2. Front Panel Section	83
3-3. Case	20	7-3. Chassis Section	84
3-4. Front Panel Assy	21	7-4. MD Mechanism Deck Section-1 (MDX-7X2A)	85
3-5. MAIN Board	21	7-5. MD Mechanism Deck Section-2 (MDX-7X2A)	86
3-6. MD Mechanism Deck (MDM-7X2A)	22	7-6. CD Mechanism Deck Section (CDM55B-21BD53)	87
3-7. BD (MD) Board, Over Write Head (HR901)	22	8. ELECTRICAL PARTS LIST	88
3-8. Holder Assy	23		
3-9. Loading Motor Assy (M103)	23		
3-10. Sled Motor Assy (M102)	24		
3-11. Optical Pick-up (KMS-262A)	24		
3-12. Spindle Motor Assy (M101)	25		
3-13. CD Mechanism Deck (CDM55B-21BD53)	25		
3-14. Holder (BU) Assy	26		
3-15. BU-21BD53, Holder (55-BU21)	26		
3-16. Tray, LOADING Board	27		
3-17. Cam (CDM55)	27		
4. TEST MODE	28		
5. ELECTRICAL ADJUSTMENTS			
MD Section	34		
CD Section	45		
6. DIAGRAMS			
6-1. Block Diagram – MD SERVO Section –	47		
6-2. Block Diagram – MAIN Section –	48		
6-3. Block Diagram – DISPLAY/POWER SUPPLY Section –	49		
6-4. Note for Printed Wiring Boards and Schematic Diagrams	50		
6-5. Printed Wiring Board – BD (CD) Board –	52		
6-6. Schematic Diagram – BD (CD) Board –	53		
6-7. Schematic Diagram – BD (MD) Board (1/2) –	54		
6-8. Schematic Diagram – BD (MD) Board (2/2) –	55		
6-9. Printed Wiring Board – BD (MD) Board –	56		
6-10. Printed Wiring Board – MAIN Board (Side A) –	58		
6-11. Printed Wiring Boards – MAIN (Side B)/LOADING Boards –	59		
6-12. Schematic Diagram – MAIN Board (1/4) –	60		
6-13. Schematic Diagram – MAIN (2/4)/LOADING Boards –	61		
6-14. Schematic Diagram – MAIN Board (3/4) –	62		
6-15. Schematic Diagram – MAIN Board (4/4) –	63		
6-16. Printed Wiring Boards – DISPLAY/LP LED/PW SW Boards –	64		
6-17. Schematic Diagram – DISPLAY/LP LED/PW SW Boards –	65		
6-18. Printed Wiring Board – TRANS Board (Except Singapore) –	66		
6-19. Schematic Diagram – TRANS Board (Except Singapore) –	67		
6-20. Printed Wiring Boards – TRANS (SP)/LF Boards (Singapore) –	68		
6-21. Schematic Diagram – TRANS (SP)/LF Boards (Singapore) –	69		

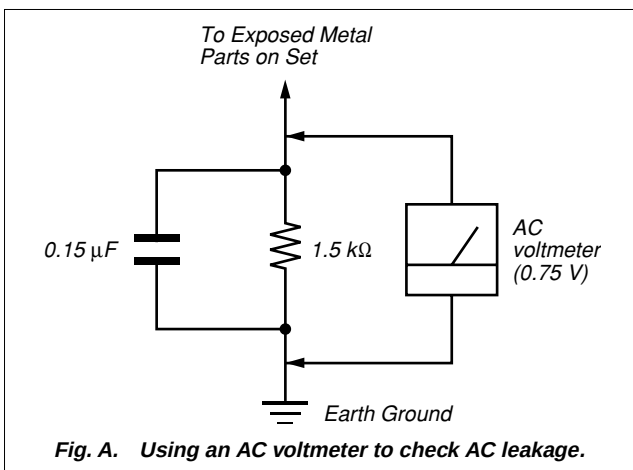
SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer: Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

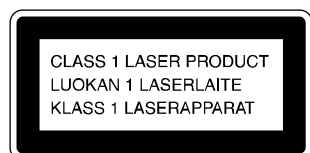
LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes.). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)



The laser component in this product is capable of emitting radiation exceeding the limit for Class 1.



This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

The following caution label is located inside of the unit.



CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer’s instructions.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt gällande föreskrifter.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SECTION 1

SERVICING NOTES

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

For CD

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

LASER DIODE AND FOCUS SEARCH OPERATION CHECK

Carry out the "S curve check" in "CD section adjustment" and check that the S curve waveforms is output three times.

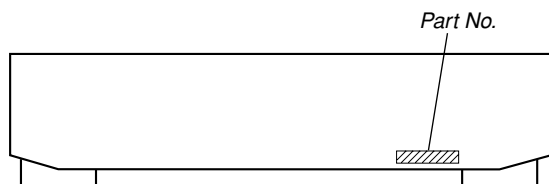
For MD

NOTES ON LASER DIODE EMISSION CHECK

Never look into the laser diode emission from right above when checking it for adjustment. It is feared that you will lose your sight.

MODEL IDENTIFICATION

— BACK PANEL —

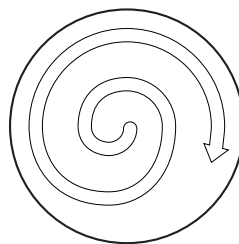


Model	Part No.
US model	4-230-771-5□
Canadian model	4-230-771-6□
AEP, UK models	4-230-771-7□
Singapore model	4-230-771-8□

CLEANING OBJECTIVE LENS OF OPTICAL PICK-UP

- In cleaning the objective lens of optical pick-up, be sure the following below.

1. In cleaning the lens, do not apply an excessive force.
As the optical pick-up is vulnerable, application of excessive force could damage the lens holder.
2. In cleaning, do not use a cleaner other than exclusive cleaning liquid (KK-91 or isopropyl alcohol).
3. Wipe the objective lens spirally from center toward outside.
(See Figure A)

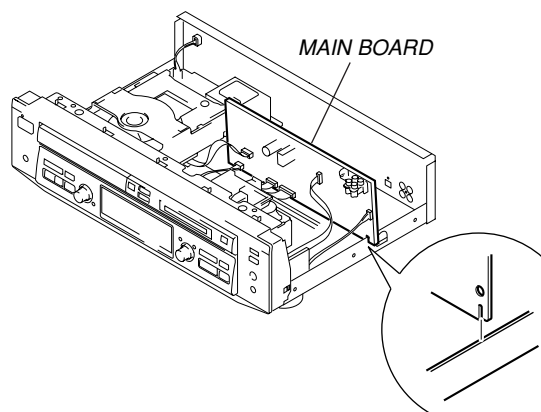


(Figure A)

4. Eject the disk, if loaded.
5. Disconnect the power cord from the socket to shut off the power supply.
6. When cleaning the objective lens of optical pick-up in CD, refer to "HOLDER (BU) ASSY" on page 26.

SERVICE POSITION

Please put the MAIN board straight as the figure shown below when performing adjustment or check on the MAIN board.



NOTE ON VOLTAGE ADJUSTMENT

Be sure to execute the Voltage Adjustment on page 46, whenever the CD base unit (BU-21BD53), mounted MAIN board, and IC506, R550, R551, or RV500 on the MAIN board were replaced.

MD SECTION

JIG FOR CHECKING BD (MD) BOARD WAVEFORM

The special jig (J-2501-196-A) is useful for checking the waveform of the BD (MD) board. The names of terminals and the checking items to be performed are shown as follows.

GND : Ground

I+3V : For measuring IOP (Check the deterioration of the optical pick-up laser)

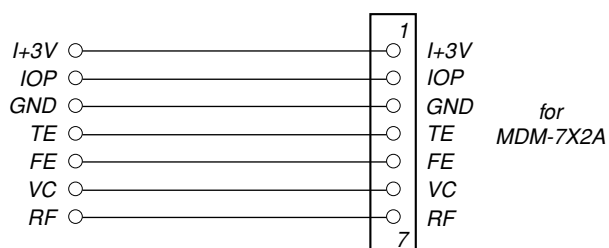
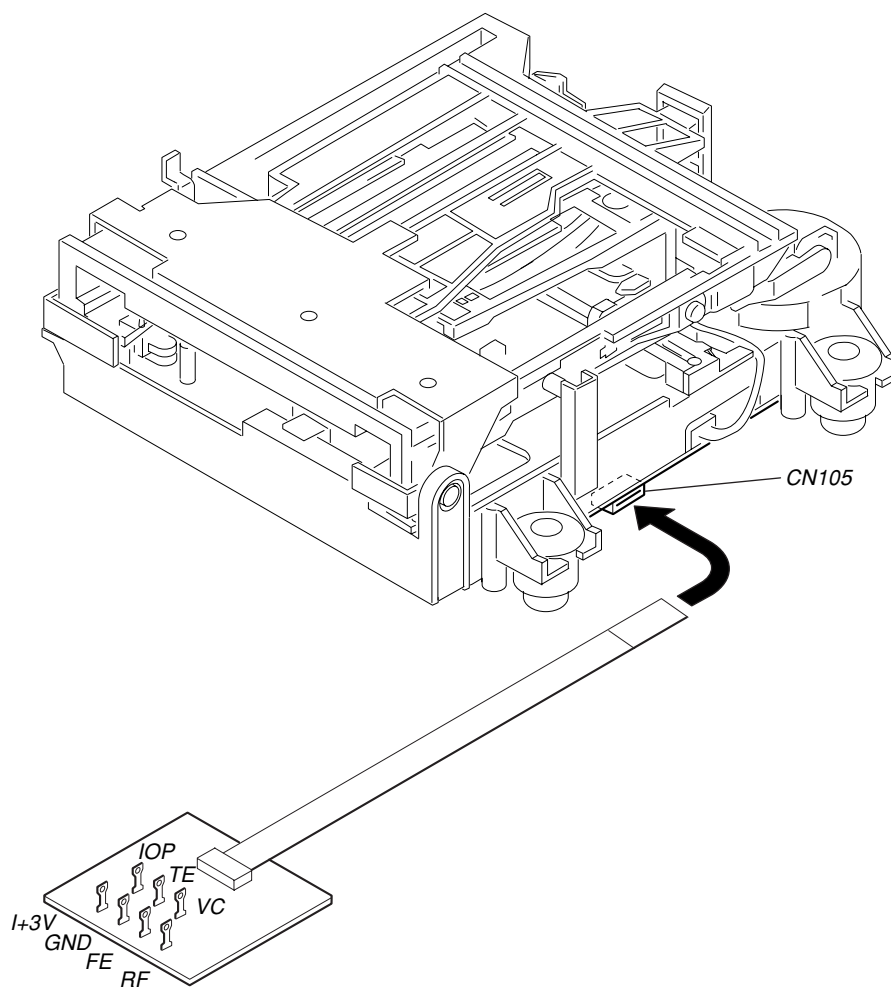
IOP : For measuring IOP (Check the deterioration of the optical pick-up laser)

TE : Tracking error signal (Traverse adjustment)

VC : Reference level for checking the signal

RF : RF signal (Check jitter)

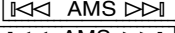
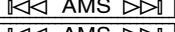
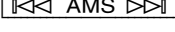
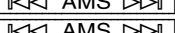
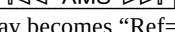
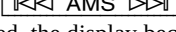
FE : Focus error signal



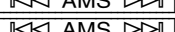
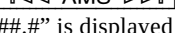
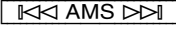
IOP DATA RECORDING AND DISPLAY WHEN OPTICAL PICK-UP AND NON-VOLATILE MEMORY (IC195 OF BD (MD) BOARD) ARE REPLACED

The IOP value labeled on the optical pick-up can be recorded in the non-volatile memory. By recording the value, it will eliminate the need to look at the value on the optical pick-up label. When replacing the optical pick-up or non-volatile memory (IC195 of BD (MD) board), record the IOP value on the optical pick-up according to the following procedure.

Record Procedure:

1. Press the  (CD),  (MD) and  buttons at the same time.
2. Press the  (MD) knob and  (MD) button to display “<To Normal> 0”.
3. Turn the  (MD) knob and when “<MD Test> 5” is displayed, press the  (MD) knob.
4. Turn the  (MD) knob to display “[Service]”, and press the  button.
5. Turn the  (MD) knob to display “Iop Write” (C05), and press the  button.
6. The display becomes “Ref=@@.@.” (@ is an arbitrary number) and the numbers which can be changed will blink.
7. Input the IOP value written on the optical pick-up label.
To select the number : Turn the  (MD) knob.
To select the digit : Press the  (MD) knob.
8. When the  button is pressed, the display becomes “Measu=@@.@.” (@ is an arbitrary number).
9. As the adjustment results are recorded for the 6 value. Leave it as it is and press the  button.
10. “Complete!” will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become “Iop Write (C05)”.
11. Press the  button to display “<MD Test> 5”.
12. To turn the power OFF, Turn the  (MD) knob and when “<Initial> 8” displayed, press the  (MD) knob.

Display Procedure:

1. Press the  (CD),  (MD) and  buttons at the same time.
2. Press the  (MD) knob and  (MD) button to display “<To Normal> 0”.
3. Turn the  (MD) knob and when “<MD Test> 5” is displayed, press the  (MD) knob.
4. Turn the  (MD) knob to display “[Service]”, and press the  button.
5. Turn the  (MD) knob to display “Iop Read” (C26), and press the  button.
6. “@@.@/##.##” is displayed and the recorded contents are displayed.
@@.@ : indicates the IOP value on the optical pick-up label.
##.## : indicates the IOP value after adjustment
7. To end, press the  (MD) knob or  button to display “Iop Read” (C26).
8. Press the  button to display “<MD Test> 5”.
9. To turn the power OFF, Turn the  (MD) knob and when “<Initial> 8” displayed, press the  (MD) knob.

CHECKS PRIOR TO PARTS REPLACEMENT AND ADJUSTMENTS IN MD

Before performing repairs, perform the following checks to determine the faulty locations up to a certain extent. Details of the procedures are described in “5 Electrical Adjustments”.

	Criteria for Determination (Unsatisfactory if specified value is not satisfied)	Measure if unsatisfactory:
Laser power check (6-2 : See page 37)	0.9 mW power Specified value : 0.80 to 0.96 mW 8.4 mW power Specified value : 8.2 to 8.6 mW	- Clean the optical pick-up - Adjust again - Replace the optical pick-up
	Iop (at 8.4mW) Labeled on the optical pick-up Iop value $\pm$ 10mA	Replace the optical pick-up
Auto check (6-4 : See page 38)	Unsatisfactory if displayed as “NG: XXXX” NG (XXXX is arbitrary number)	Replace the optical pick-up
Temperature compensation offset check (6-1 : See page 37)	Unsatisfactory if displayed as “T=@@ (##) [NG” NG (@@, ## are both arbitrary numbers)	- Check for disconnection of the circuits around D101 (BD (MD) board) - Check the signals around IC101, IC151, CN102, CN103 (BD (MD) board)

Note:

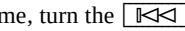
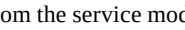
The criteria for determination above is intended merely to determine if satisfactory or not, and does not serve as the specified value for adjustments. When performing adjustments, use the specified values for adjustments.

SERVICE MODE

This set provides various modes for the service.

Enter the service mode through the procedure given below, and select the desired mode.

Procedure:

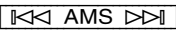
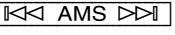
1. Press the  (CD),  (MD) and  buttons at the same time.
2. Press the  (MD) knob and  (MD) button to display “<To Normal> 0”.
3. At this time, turn the  (MD) knob can select all modes. For the contents of mode, see the following table.
4. To exit from the service mode, turn  (MD) knob to display “<To Normal> 0”, then press the  (MD) knob.

Contents of test mode

No.	Display	Function
0	<To Normal> 0	Exit from test mode
1	<Version> 1	Microcomputer Version display
2	<FLD> 2	FL display test & LED display test
3	<Key, Jog> 3	Key/Jog input test
4	<CD Test> 4	CD all sorts test
5	0> COMMAND	Command transfer menu
6	1> ERROR	C1, C2 error display
7	2> SPEED X1	Disc speed selection
8	3> ISRC	ISRC display
9	4> CHECK8	Check 8 cm display
10	5> AUTO G	Auto gain display
11	6> HENSHIN	Decentiering display
12	7> PORT	Port selection
13	8> AMS ON	AMS display
14	9> TRK ON	TRK ON/OFF display
15	A> SJI	Not Support
16	<MD Test> 5	MD all sorts test
17	<Retry & TOC> 6	MD TOC off & Retry test
18	<PC LINK> 7	PC connection check
19	<Initial> 8	All reset
20	<MD Update> 9	Software update
21	<Sircs> 10	Sircs code mode
22	<Dump> 11	Microcomputer Dump mode
23	<CD Aging> 12	CD aging
24	<Rep 5 off> 13	Cancel restriction of repeat five times
25	<KeyBoard> 14	Keyboard check
26	<Special> 15	Command, Sircs test
27	<CD ship> 16	Shipment mode

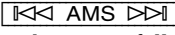
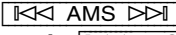
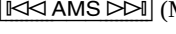
Microcomputer Version Display

Procedure:

1. Enter the service mode, then turn  (MD) knob to display "<Version> 1", and press the  (MD).
2. The CD microcomputer version is displayed, and then press the  (MD) knob, and the MD microcomputer version and the display microcomputer version will be displayed.
3. To exit from the mode, press the  (MD) knob.

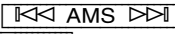
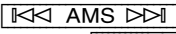
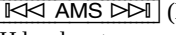
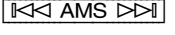
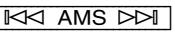
FL Display Test/LED display test

Procedure:

1. Enter the service mode, then turn  (MD) knob to display "<FLD> 2", and press the  (MD).
2. All segments of fluorescent display tube turn on fully, and all LEDs turn off fully. Then, successive pressing the  (MD) knob causes all segments of fluorescent display tube to turn off fully and all LEDs to turn on fully.
3. To exit from the mode, press the  (MD) knob.

Key/Jog Input Test

Procedure:

1. Enter the service mode, then turn  (MD) knob to display "<Key, Jog> 3", and press the  (MD).
2. Clockwise rotation of the  (MD) knob moves the R-CH level meter, or counterclockwise rotation of the  (MD) knob moves the L-CH level meter.
3. Press the buttons in order, and when all buttons were pressed, "Key OK!" will be displayed.
4. To exit from the mode, press the  (MD) knob.

Software Reset

Procedure:

1. Enter the service mode, then turn  (MD) knob to display "<Initial> 8", and press the  (MD).
2. The microcomputer resets the software, and the power is turned off.

RETRY CAUSE DISPLAY MODE IN MD

- In this test mode, the causes for retry of the unit during recording can be displayed on the fluorescent indicator tube. During playback, the “track mode” for obtaining track information will be set. This is useful for locating the faulty part of the unit.
- The following will be displayed :
 During recording and stop : Retry cause, number of retries, and number of retry errors.
 During playback : Information such as type of disc played, part played, copyright.
 These are displayed in hexadecimal.

Procedure:

- Load a recordable disc whose contents can be erased into the unit.
- Press the **MENU/NO** button. When “Edit Menu” is displayed on the fluorescent indicator tube, turn the **◀◀ AMS ▶▶** (MD) knob to display “All Erase?”.
- Press the **YES** button. (Or press the **◀◀ AMS ▶▶** (MD) knob)
- “All Erase?” is displayed on the fluorescent indicator tube.
- Press the **YES** button to display “Complete!”.
- Press the **■** (CD), **■** (MD) and **YES** buttons at the same time. Press the **◀◀ AMS ▶▶** (MD) knob and **■** (MD) button to display “<To Normal> 0”. Turn the **◀◀ AMS ▶▶** (MD) knob and when “<Retry & TOC> 6” is displayed, press the **◀◀ AMS ▶▶** (MD) knob.
- Press the **REC ●** button to start recording. Then press the **■** (MD) button and start recording.
- To check the “track mode”, press the **▶** (MD) button to start play.
- Press the **I/D** button to display “<MD Test> 5”.
- To turn the power OFF, turn the **◀◀ AMS ▶▶** (MD) knob and when the **◀◀ AMS ▶▶** (MD) knob. When “TOC” disappears, disconnect the power plug from the outlet.

**Fig. 1 Reading the Test Mode Display
(During recording and stop)**

RTs@#e**
Fluorescent indicator tube display

@@ : Cause of retry
: Number of retries
****** : Number of retry errors

**Fig. 2 Reading the Test Mode Display
(During playback)**

@@ #### \$
Fluorescent indicator tube display

@@ : Parts No. (name of area named on TOC)
: Cluster }
****** : Sector } Address
\$: Track mode (Track information such as copy-right information of each part)

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa-decimal	Cause of Retry	Occurring conditions
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	shock	When track jump (shock) is detected
	0	0	0	0	0	0	1	0	02	ader5	When ADER was counted more than five times continuously
	0	0	0	0	0	1	0	0	04	Discontinuous address	When ADIP address is not continuous
	0	0	0	0	1	0	0	0	08	DIN unlock	When DIN unlock is detected
	0	0	0	1	0	0	0	0	10	FCS incorrect	When not in focus
	0	0	1	0	0	0	0	0	20	IVR rec error	When ABCD signal level exceeds the specified range
	0	1	0	0	0	0	0	0	40	CLV unlock	When CLV is unlocked
	1	0	0	0	0	0	0	0	80	Access fault	When access operation is not performed normally

Reading the Display:

Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example

When 42 is displayed:

Higher bit: 4 = 0100 → b6

Lower bit : 2 = 0010 → b1

In this case, the retry cause is combined of “CLV unlock” and “ader5”.

When A2 is displayed:

Higher bit: A = 1010 → b7 + b5

Lower bit : 2 = 0010 → b1

The retry cause in this case is combined of “Access fault”, “IVR rec error”, and “ader5”.

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa- decimal	Details	
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0		When 0	When 1
Binary	0	0	0	0	0	0	0	1	01	Emphasis OFF	Emphasis ON
	0	0	0	0	0	0	1	0	02	Monaural	Stereo
	0	0	0	0	0	1	0	0	04	This is 2-bit display. Normally 01. 01:Normal audio. Others:Invalid	
	0	0	0	0	1	0	0	0	08		
	0	0	0	1	0	0	0	0	10	Audio (Normal)	Invalid
	0	0	1	0	0	0	0	0	20	Original	Digital copy
	0	1	0	0	0	0	0	0	40	Copyright	No copyright
	1	0	0	0	0	0	0	0	80	Write prohibited	Write allowed

Reading the Display:

Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example When 84 is displayed:

Higher bit: 8 = 1000 → b7

Lower bit : 4 = 0100 → b2

In this case, as b2 and b7 are 1 and others are 0, it can be determined that the retry cause is combined of “Emphasis OFF”, “Monaural”, “Original”, “Copyright”, and “Write allowed”.

Example When 07 is displayed:

Higher bit: 0 = 0000 → All 0

Lower bit : 7 = 0111 → b0 + b1 + b2

In this case, as b0, b1, and b2 are 1 and others are 0, it can be determined that the retry cause is combined of “Emphasis ON”, “Stereo”, “Original”, “Copyright”, and “Write prohibited”.

Hexadecimal → Binary Conversion Table

Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

CD SECTION

- In checking the CD block and MAIN board, prepare jig.
- In checking the CD block, prepare jig (extension cable J-2501-075-A) to connect the BD (CD) board (CN101) and MAIN board (CN302).
- In checking the MAIN board, prepare jig (extension cable J-2501-094-A) to connect the MAIN board (CN305) and DISPLAY board (CN951).

CD-TEXT TEST DISC

This unit is able to display the test data (character information) written in the CD on its fluorescent indicator tube.
The CD-TEXT TEST DISC (TGCS-313:4-989-366-01) is used for checking the display.
To check, perform the following procedure.

Checking Method:

1. Turn ON the power, set the disc to the disc table with the “test disc” label facing up, and chuck the disc.
2. Press the  (CD) button and play back the disc.
3. The following will be displayed on the fluorescent indicator tube.
Display : 1KHz/0dB
4. Rotating  (CD) knob, select the track. The text data of each track will be displayed.
For details of the displayed contents for each track, refer to “Table 1 : CD-TEXT TEST DISC TEXT Data Contents” and “Table 2 : CD-TEXT TEST DISC Recorded Contents and Display”.

Restrictions in CD-TEXT Display

In this unit, some special characters will not be displayed properly. These will be displayed as a space or a character resembling it. For details, refer to “Table 2 : CD-TEXT DISC Recorded Contents and Display”.

Table 1 : CD-TEXT TEST DISC TEXT Data Contents (TRACKS No. 1 to 41:Normal Characters)

TRACK No.	Displayed Contents	TRACK No.	Displayed Contents
1	1kHz/0dB/L&R	22	1kHz/−90dB/L&R
2	20Hz/0dB/L&R	23	Infinity Zero w/o emphasis//L&R
3	40Hz/0dB/L&R	24	Infinity Zero with emphasis//L&R
4	100Hz/0dB/L&R	25	400Hz+7kHz(4:1)/0dB/L&R
5	200Hz/0dB/L&R	26	400Hz+7kHz(4:1)/−10dB/L&R
6	500Hz/0dB/L&R	27	19kHz+20kHz(1:1)/0dB/L&R
7	1kHz/0dB/L&R	28	19kHz+20kHz(1:1)/−10dB/L&R
8	5kHz/0dB/L&R	29	100Hz/0dB/L*
9	7kHz/0dB/L&R	30	1kHz/0dB/L*
10	10kHz/0dB/L&R	31	10kHz/0dB/L*
11	16kHz/0dB/L&R	32	20kHz/0dB/L*
12	18kHz/0dB/L&R	33	100Hz/0dB/R*
13	20kHz/0dB/L&R	34	1kHz/0dB/R*
14	1kHz/0dB/L&R	35	10kHz/0dB/R*
15	1kHz/−1dB/L&R	36	20kHz/0dB/R*
16	1kHz/−3dB/L&R	37	100Hz Squer Wave//L&R
17	1kHz/−6dB/L&R	38	1kHz Squer Wave//L&R
18	1kHz/−10dB/L&R	39	1kHz w/emphasis/−0.37dB/L&R
19	1kHz/−20dB/L&R	40	5kHz w/emphasis/−4.53dB/L&R
20	1kHz/−60dB/L&R	41	16kHz w/emphasis/−9.04dB/L&R
21	1kHz/−80dB/L&R		

Note: The contents of Track No. 1 to 41 are the same as those of the current TEST DISC-their titles are displayed.

Table 2: CD-TEXT TEST DISC Recorded Contents and Display

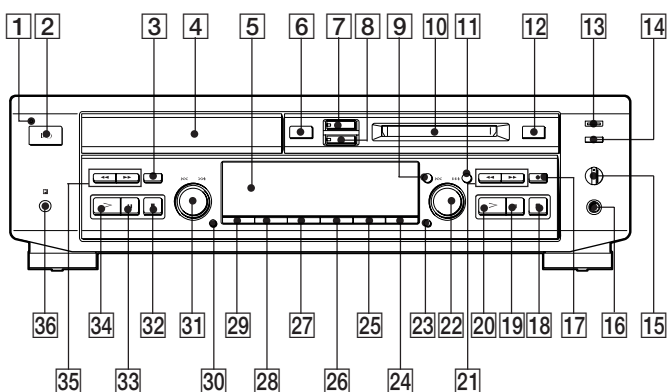
(In this unit, some special characters cannot be displayed. This is not a fault)

TRACK No.	Recorded contents	Display
42	! " # \$ % & ' (21h to 27h) 1kHz 0dB L&R	← All the same
43	() * + , - . / (28h to 2Fh)	← All the same
44	0 1 2 3 4 5 6 7 (30h to 37h)	← All the same
45	8 9 : ; < = > ? (38h to 3Fh)	← All the same
46	@ A B C D E F G (40h to 47h)	← All the same
47	H I J K L M N O (48h to 4Fh)	← All the same
48	P Q R S T U V W (50h to 57h)	← All the same
49	X Y Z [¥] ^ _ (58h to 5Fh)	← All the same
50	` a b c d e f g (60h to 67h)	← All the same
51	h i j k l m n o (68h to 6Fh)	← All the same
52	p q r s t u v w (70h to 77h)	← All the same
53	x y z { } ~ ■ (78h to 7Fh)	← All the same
54	■ i ¢ £ ¤ ¥ ¦ § (A0h to A7h) 8859-1	(A0h to A7h) 8859-1
55	♪ © ª « ¬ ® ¯ (A8h to AFh)	(A8h to AFh)
56	• ± ² ³ ´ µ ¶ • (B0h to B7h)	(B0h to B7h)
57	† † ° » ¼ ½ ¾ ¿ (B8h to BFh)	(B8h to BFh)
58	À Á Â Ã Ä Å Æ Ç (C0h to C7h)	A A A A A A C (C0h to C7h)
59	È É Ê Ë Ì Í Î Ï (C8h to CFh)	E E E E I I I I (C8h to CFh)
60	Ð Ñ Ò Ó Ô Õ Ö × (D0h to D7h)	D N O O O O O (D0h to D7h)
61	Ø Ù Ú Û Ü Ý Þ ß (D8h to DFh)	O U U U U Y (D8h to DFh)
62	à á â ã ä å æ ç (E0h to E7h)	a a a a a a c (E0h to E7h)
63	è é ê ë ì í î ï (E8h to FFh)	e e e e i i i i (E8h to EFh)
64	ð ñ ò ó ô õ ö ÷ (F0h to F7h)	d n o o o o o (F0h to F7h)
65	ø ù ú û ü ý þ ÿ (F8h to FFh)	o u u u u y y (F8h to FFh)
66	No.66	← All the same
67	No.67	← All the same
to	to	to
99	No.99	← All the same

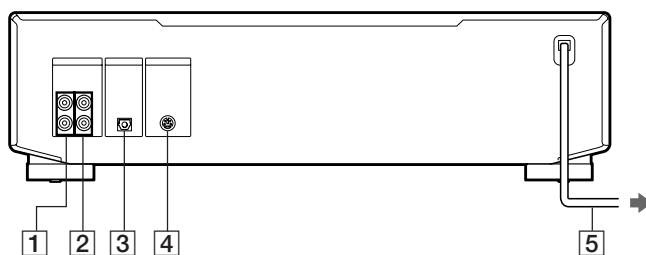
SECTION 2 GENERAL

This section is extracted from instruction manual.

Front view



Rear view

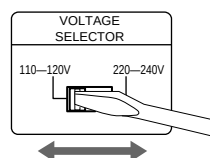


- 1 STANDBY indicator
- 2 I/⏻ (power) button
- 3 REC-IT button
- 4 CD tray
- 5 Display window
- 6 ≡ OPEN/CLOSE (CD) button
- 7 CD SYNCHRO NORMAL button
- 8 CD SYNCHRO HIGH button
- 9 MENU/NO button
- 10 MD insertion slot
- 11 YES button
- 12 ≡ EJECT (MD) button
- 13 MD LP indicator
- 14 REC MODE button
- 15 PHONE LEVEL control
- 16 PHONES jack
- 17 REC ● button
- 18 ■ (MD) button
- 19 || (MD) button
- 20 ▷ (MD) button
- 21 ◀▶ (MD) button
- 22 AMS (MD) control
- 23 CLEAR (MD) button
- 24 MD TIME/CHAR button
- 25 MD PLAY MODE button
- 26 INPUT button
- 27 DISPLAY button
- 28 CD PLAY MODE button
- 29 CD TIME button
- 30 CLEAR (CD) button
- 31 AMS (CD) control
- 32 ■ (CD) button
- 33 || (CD) button
- 34 ▷ (CD) button
- 35 ◀▶ (CD) button
- 36 Remote sensor

- 1 ANALOG IN jack
- 2 ANALOG OUT jack
- 3 DIGITAL OPTICAL IN terminal
- 4 PC LINK terminal
- 5 AC power cord

Setting the voltage selector (Singaporean model only)

Check that the voltage selector on the rear panel of the deck is set to the local power line voltage. If not, set the selector to the correct position using a screwdriver before connecting the AC power cord to an AC outlet.



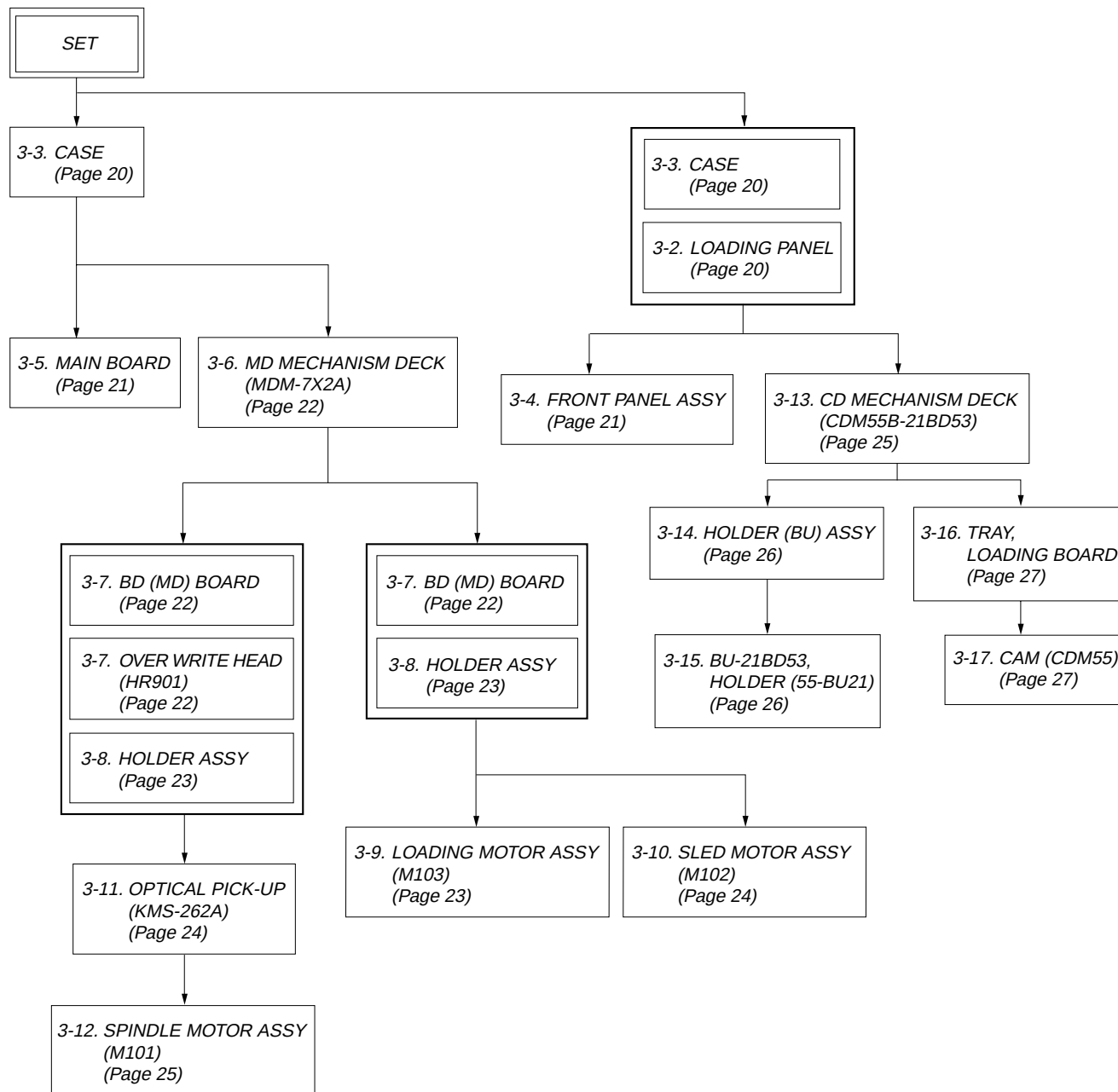
SECTION 3 DISASSEMBLY

- This set can be disassembled in the order shown below.

3-1. DISASSEMBLY FLOW

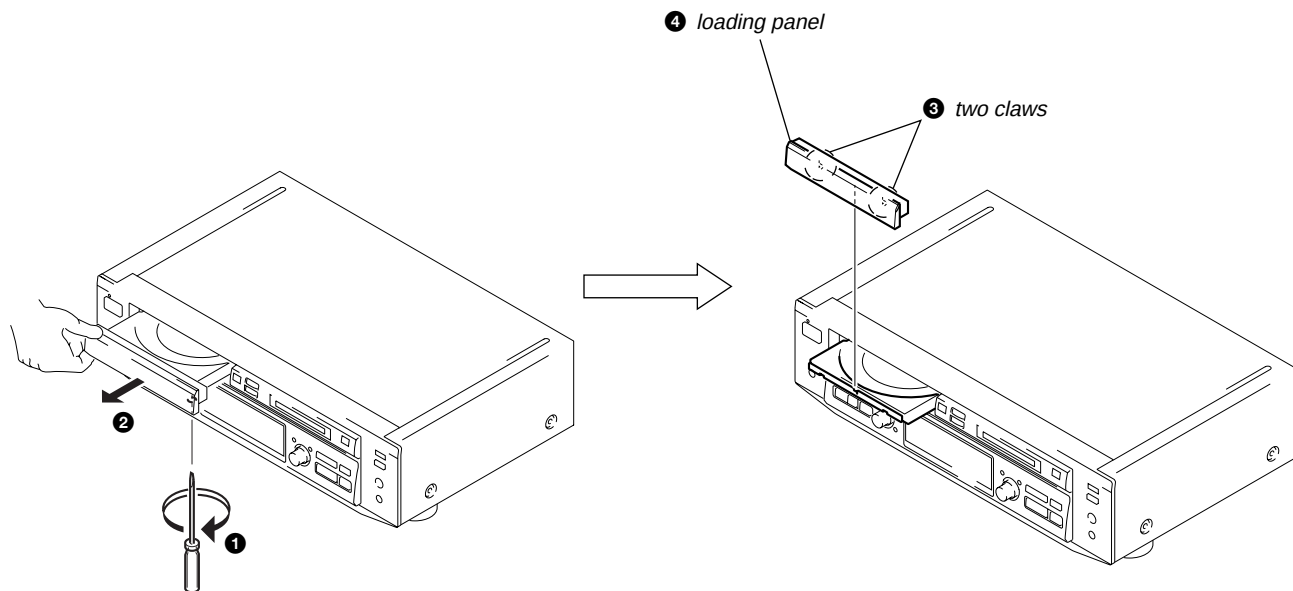
Note: The process described in  can be performed in any order.

Note: Without completing the process described in , the next process can not be performed.

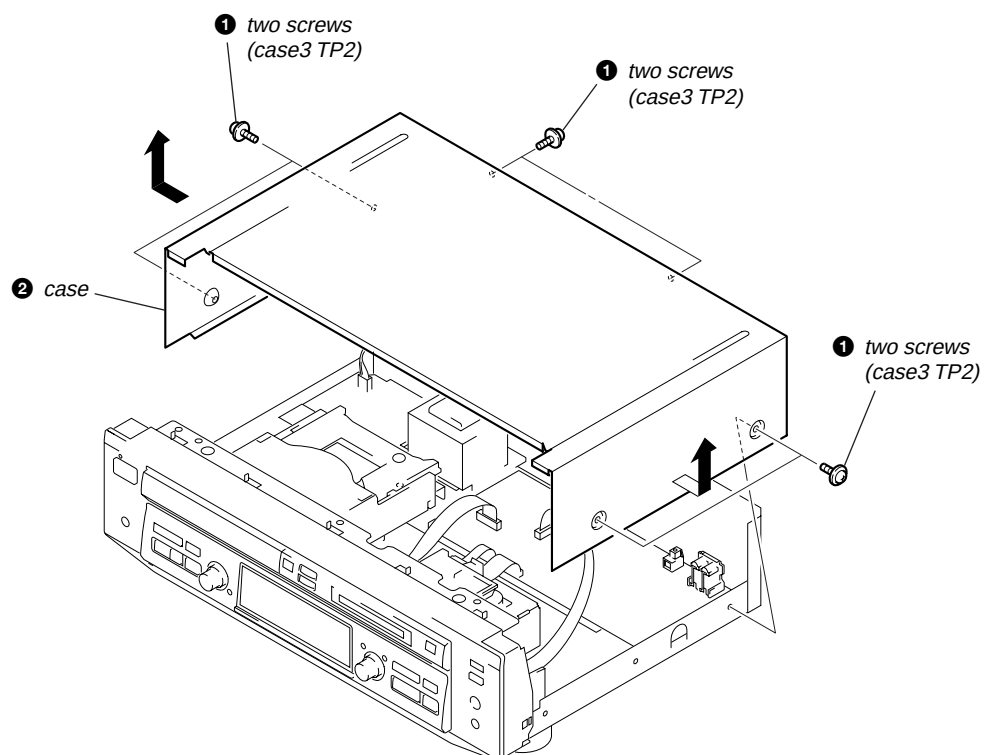


Note: Follow the disassembly procedure in the numerical order given.

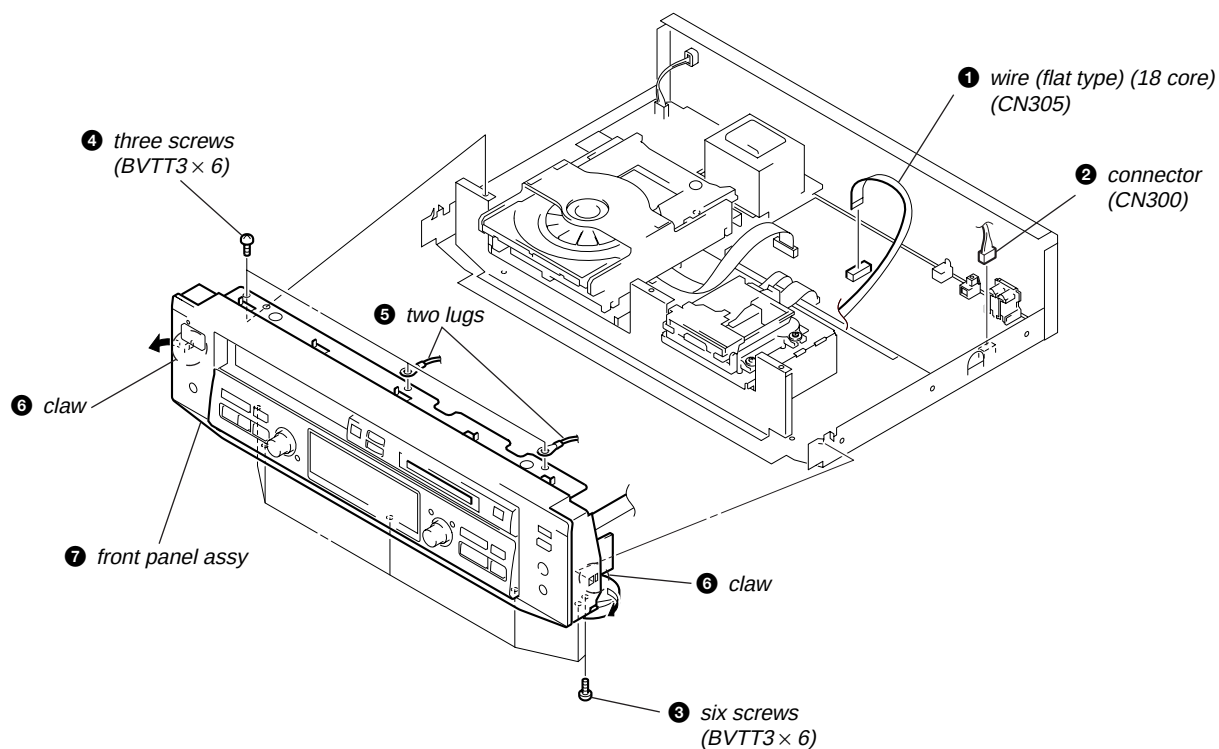
3-2. LOADING PANEL



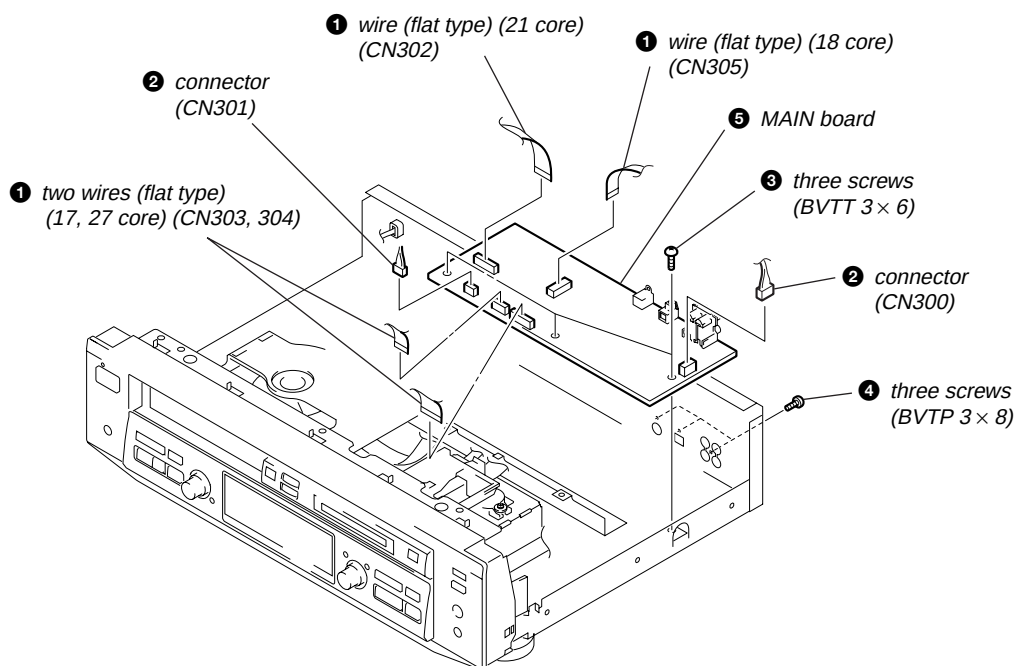
3-3. CASE



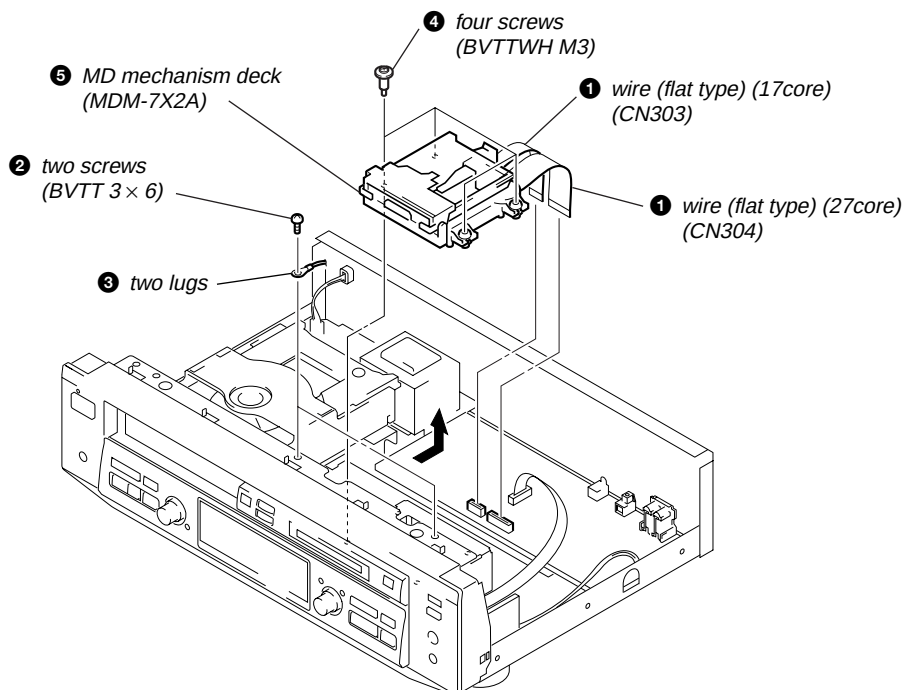
3-4. FRONT PANEL ASSY



3-5. MAIN BOARD



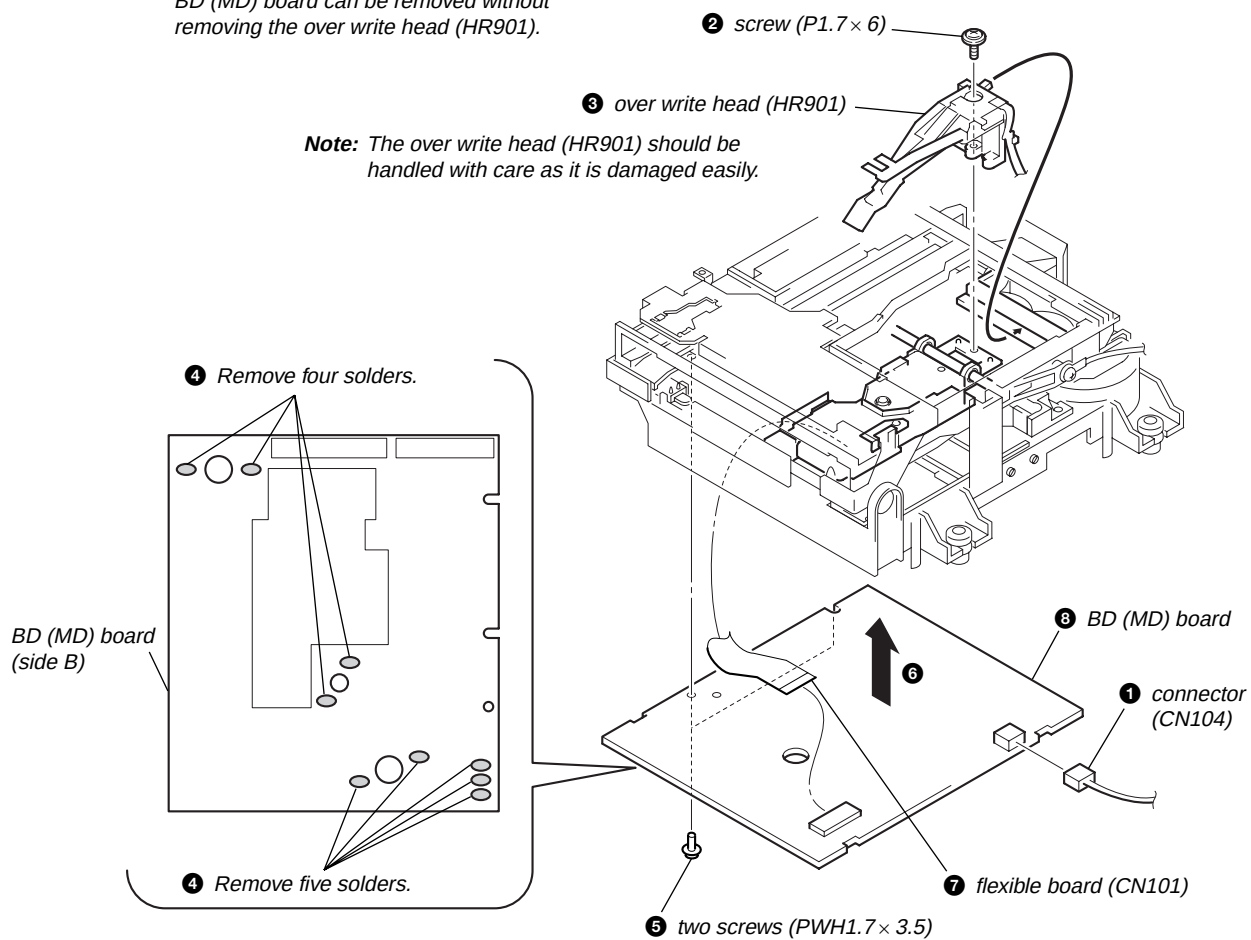
3-6. MD MECHANISM DECK (MDM-7X2A)



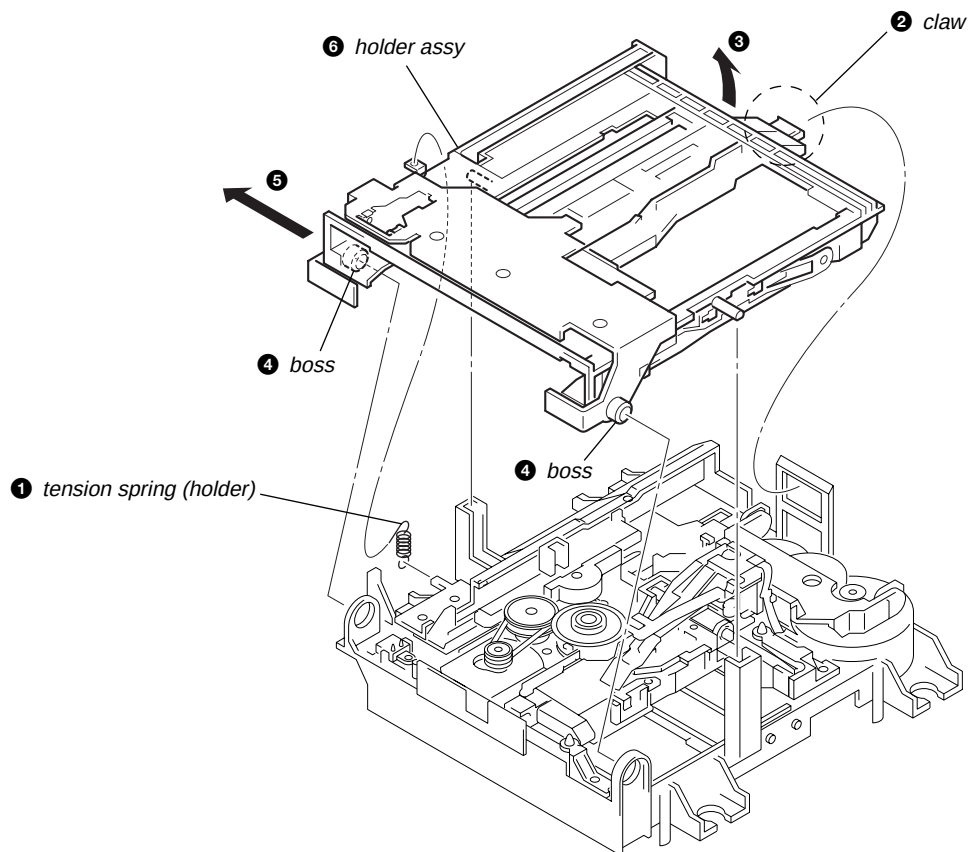
3-7. BD (MD) BOARD, OVER WRITE HEAD (HR901)

Note: By means of removing ① connector (CN104), BD (MD) board can be removed without removing the over write head (HR901).

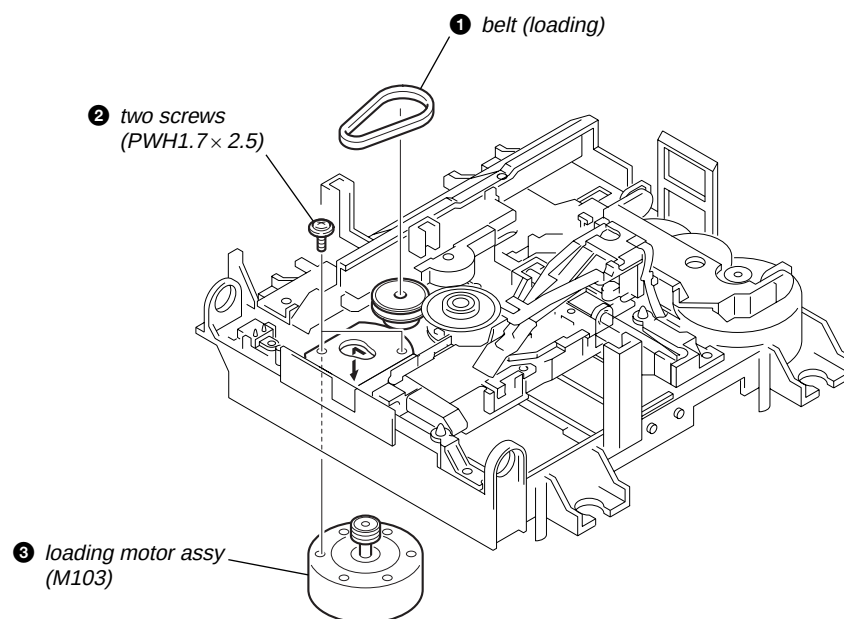
Note: The over write head (HR901) should be handled with care as it is damaged easily.



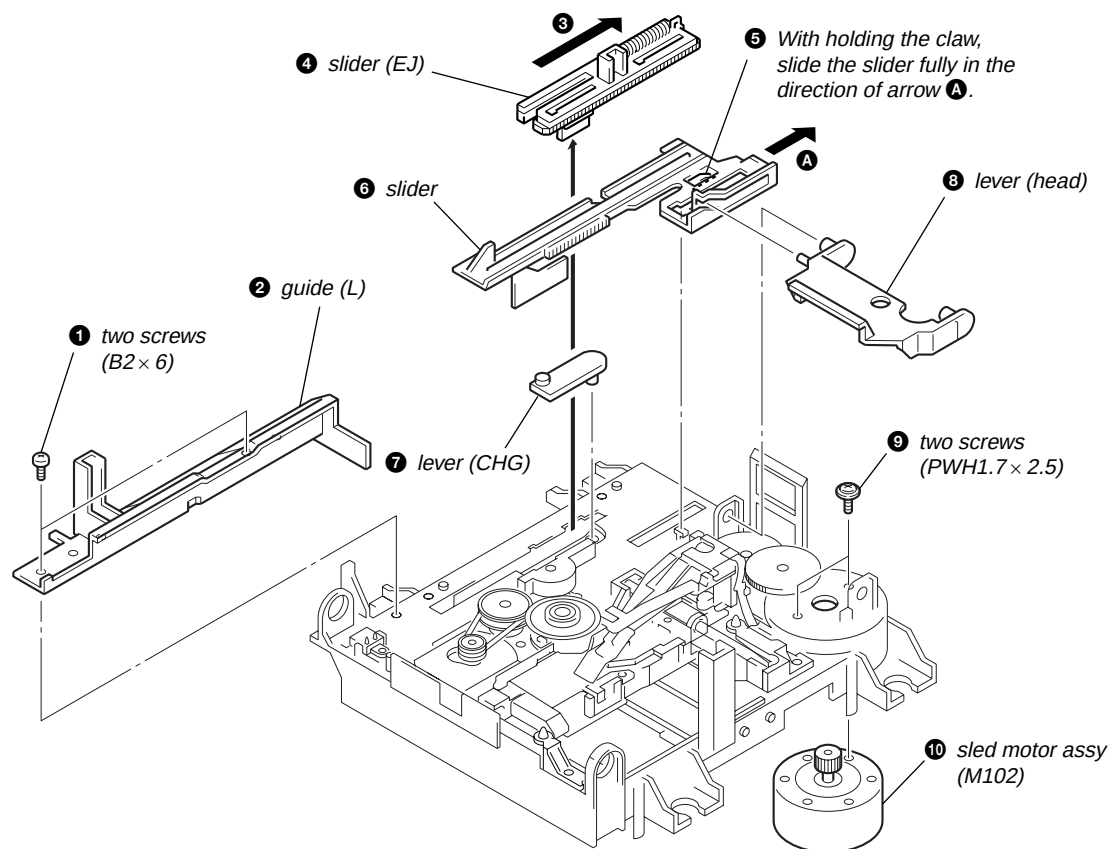
3-8. HOLDER ASSY



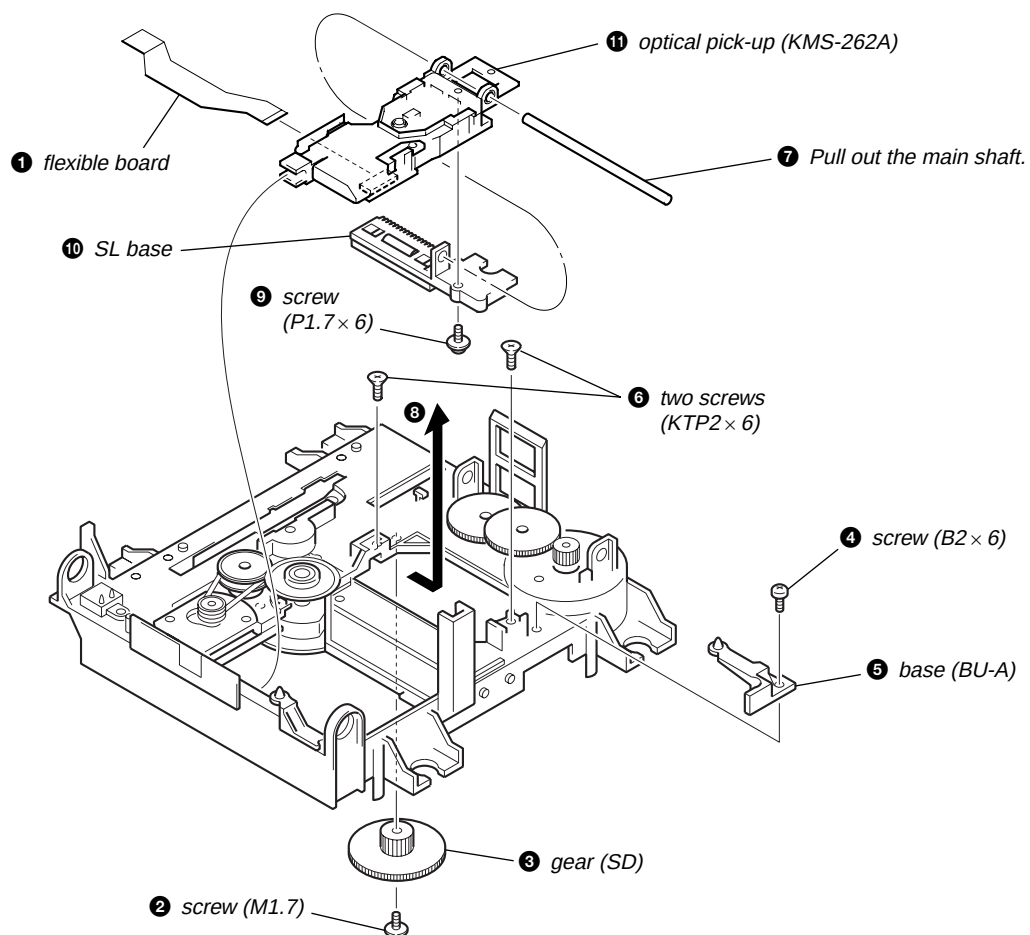
3-9. LOADING MOTOR ASSY (M103)

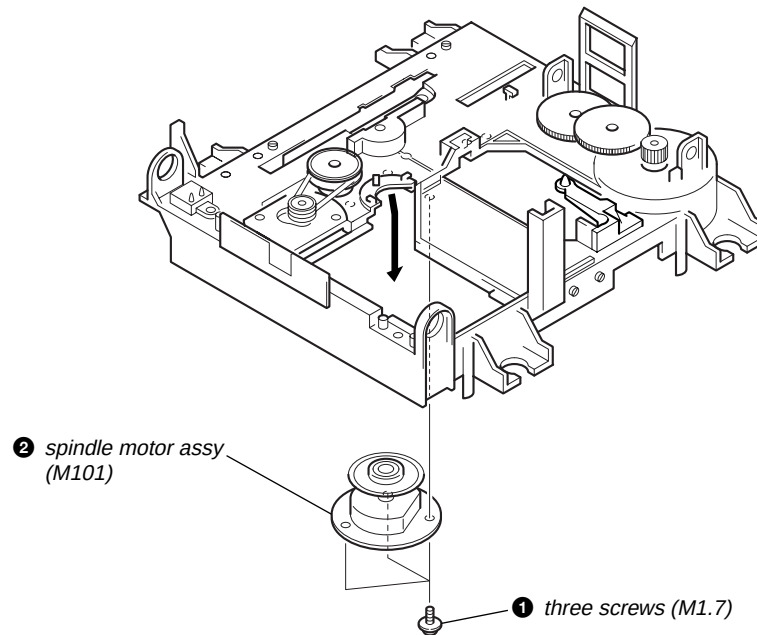
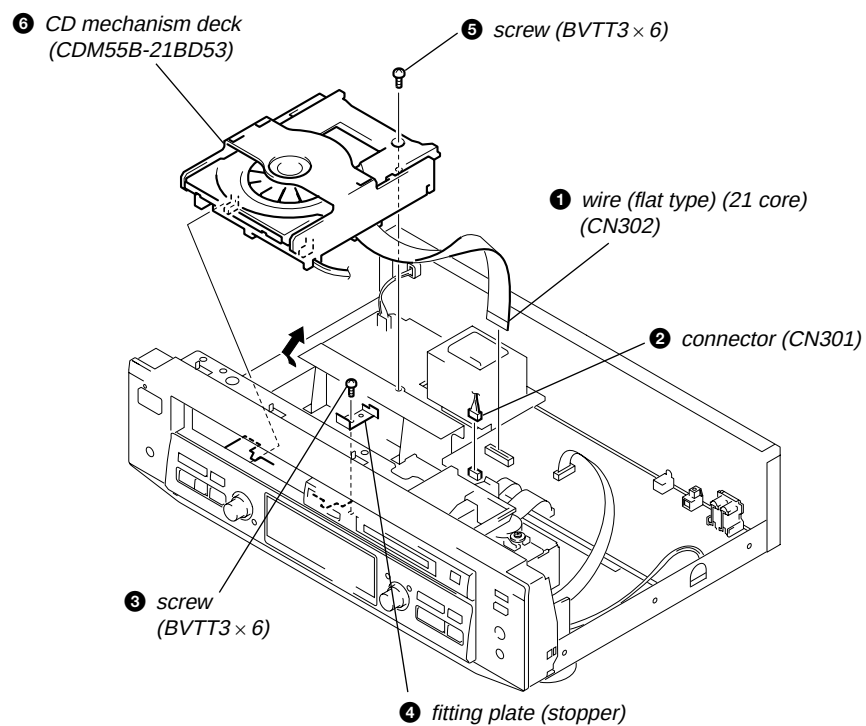


3-10. SLED MOTOR ASSY (M102)

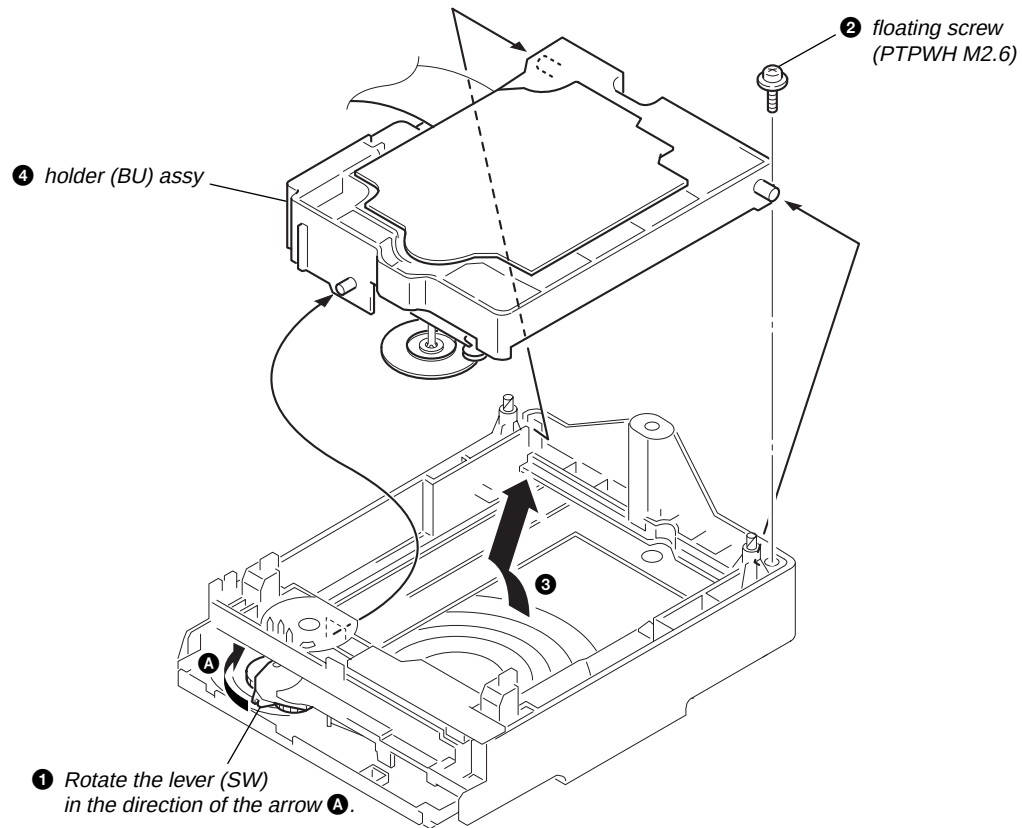


3-11. OPTICAL PICK-UP (KMS-262A)

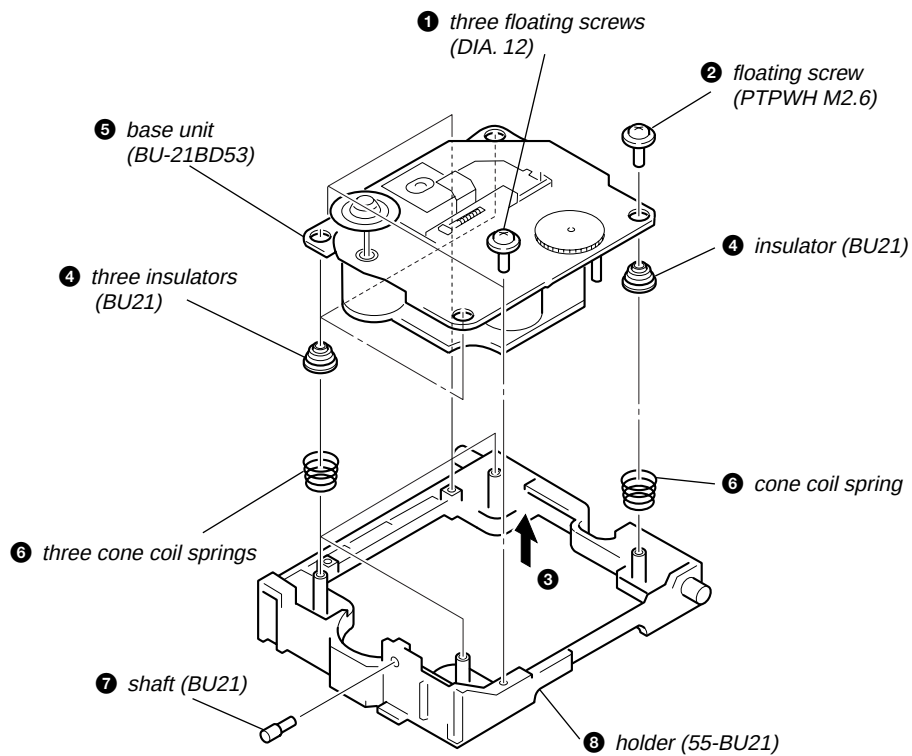


3-12. SPINDLE MOTOR ASSY (M101)**3-13. CD MECHANISM DECK (CDM55B-21BD53)**

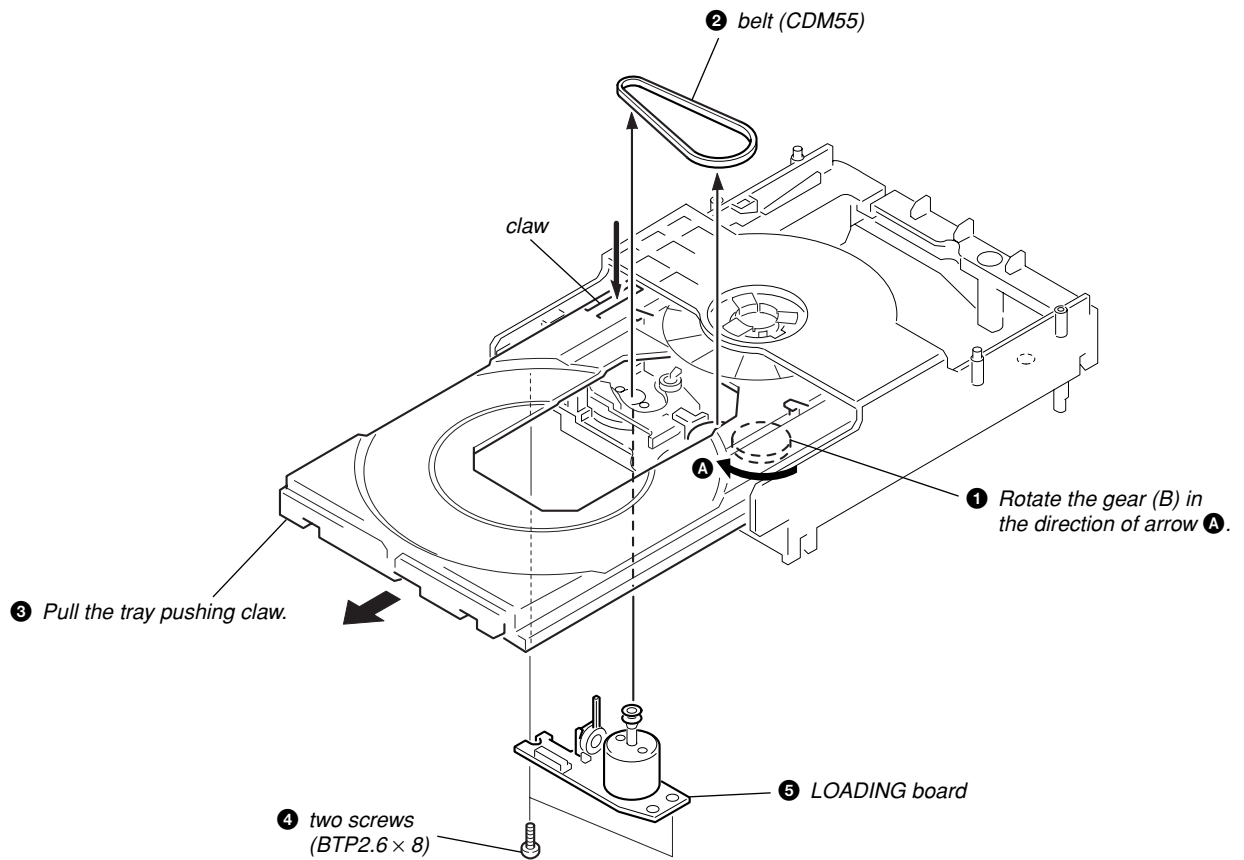
3-14. HOLDER (BU) ASSY



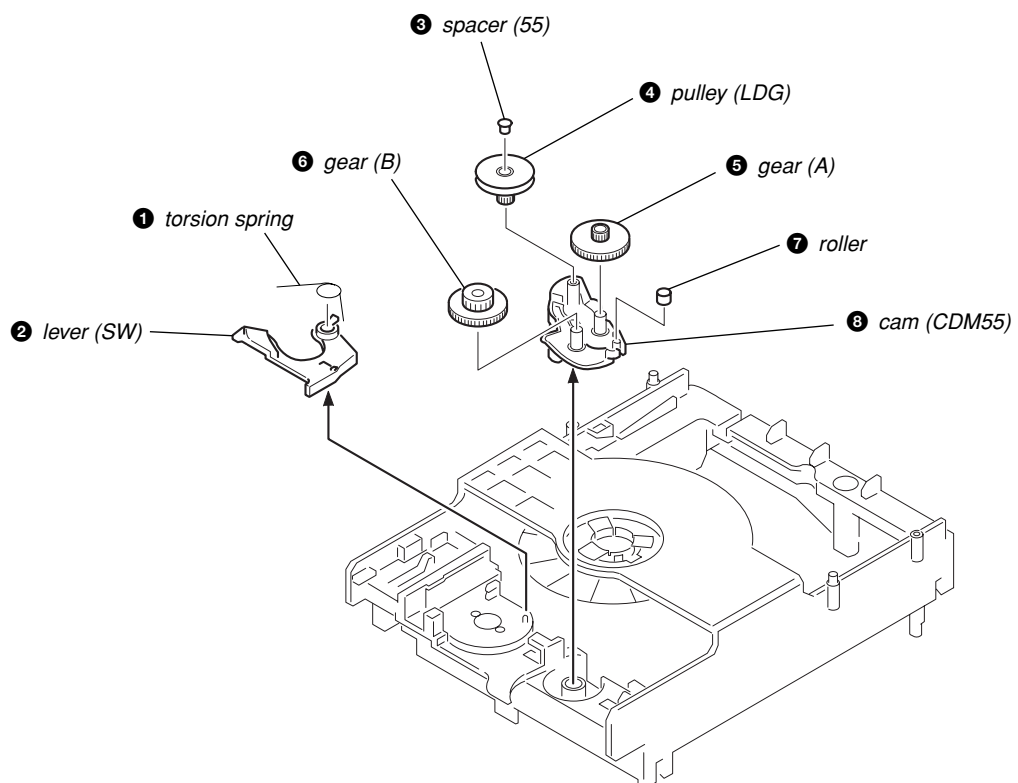
3-15. BU-21BD53, HOLDER (55-BU21)



3-16. TRAY, LOADING BOARD



3-17. CAM (CDM55)



SECTION 4
TEST MODE

MD SECTION

Note: MD always plays double speed.

1. PRECAUTIONS FOR USE OF TEST MODE

- As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
Even if the **EJECT** button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
Therefore, it will be ejected while rotating.
Be sure to press the **EJECT** button after pressing the **MENU/NO** button and the rotation of disc is stopped.

1-1. Recording laser emission mode and operating buttons

- Continuous recording mode (CREC MODE)
- Laser power check mode (LDPWR CHECK)
- Laser power adjustment mode (LDPWR ADJUST)
- Iop check (Iop compare)
- Iop value non-volatile writing (Iop NV save)
- Traverse (MO) check (EF MO CHECK)
- Traverse (MO) adjustment (EF MO ADJUST)
- When pressing the **REC** button.

2. SETTING THE TEST MODE

Press the **CD**, **MD** and **YES** buttons at the same time.
Press the **AMS** (MD) knob and **MD** button to display “<To Normal> 0”.
Turn the **AMS** (MD) knob and when “<MD Test> 5” is displayed, press the **AMS** (MD) knob.
When the test mode is set, “[Check]” will be displayed. Turn the **AMS** (MD) knob switches between the following three groups; **Check** **Service** **Develop** ...

Note: Do not use the test mode in the [Develop] group.
If used, the unit may not operate normally.
If the [Develop] group is set accidentally, press the **MENU/NO** button immediately to exit the [Develop] group.

3. RELEASING THE TEST MODE

Press the **I/** button to display “<MD Test> 5”, then to turn the power OFF, turn the **AMS** (MD) knob and when “<Initial> 8” displayed, press the **AMS** (MD) knob.

4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the **AMS** (MD) knob, **YES** button, and **MENU/NO** button.
The functions of these buttons are as follows.

Function name	Function
AMS (MD) knob (turn)	Select.
AMS (MD) knob (push)	Set Sub menu.
YES button	Proceeds onto the next step. Finalizes input.
MENU/NO button	Returns to previous step. Stops operations.

5. SELECTING THE TEST MODE

There are 26 types of test modes as shown below. The groups can be switched by turning the **◀◀ AMS ▶▶** (MD) knob. After selecting the group to be used, press the **[YES]** button. After setting a certain group, turn the **◀◀ AMS ▶▶** (MD) knob switches between these modes.

Refer to “Group” in the table for details can be selected.

All items used for servicing can be treated using group [Service]. So be carefully not to enter other groups by mistake.

Note: Do not use the test mode in the [Develop] group.

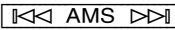
If used, the unit may not operate normally.

If the [Develop] group is set accidentally, press the **[MENU/NO]** button immediately to exit the [Develop] group.

Display	No.	Details	Mark	Group	
				Check	Service
AUTO CHECK	C01	Automatic self-diagnosis			○
Err Display	C02	Error history display, clear			○
TEMP ADJUST	C03	Temperature compensation offset adjustment			○
LDPWR ADJUST	C04	Laser power adjustment			○
Iop Write	C05	Iop data writing			○
Iop NV Save	C06	Writes current Iop value in read nonvolatile memory using microprocessor			○
EF MO ADJUST	C07	Traverse (MO) adjustment			○
EF CD ADJUST	C08	Traverse (CD) adjustment			○
FBIAS ADJUST	C09	Focus bias adjustment			○
AG Set (MO)	C10	Auto gain output level adjustment (MO)			○
AG Set (CD)	C11	Auto gain output level adjustment (CD)			○
TEMP CHECK	C12	Temperature compensation offset check		○	○
LDPWR CHECK	C13	Laser power check		○	○
EF MO CHECK	C14	Traverse (MO) check		○	○
EF CD CHECK	C15	Traverse (CD) check		○	○
FBIAS CHECK	C16	Focus bias check		○	○
ScurveCHECK	C17	S-curve check	×	○	
VERIFYMODE	C18	Nonvolatile memory check	×	○	
DETRK CHECK	C19	Detrack check	×	○	
0920 CHECK	C25	Most circumference check	×	○	
Iop Read	C26	Iop data display		○	○
Iop Compare	C27	Comparison with initial Iop value written in nonvolatile memory		○	○
ADJ CLEAR	C28	Initialization of nonvolatile memory for adjustment values			○
INFORMATION	C31	Display of microprocessor version, etc.		○	○
CPLAY2MODE	C36	Continuous playback mode		○	○
CREC 2MODE	C37	Continuous recording mode		○	○

- For details of each adjustment mode, refer to “SECTION 5. Electrical Adjustments”.
For details of “Err Display”, refer to “Self-Diagnosis Function” on page 3.
- If a different mode has been selected by mistake, press the **[MENU/NO]** button to release that mode.
- Modes with (×) in the Mark column are not used for servicing and therefore are not described in detail. If these modes are set accidentally, press the **[MENU/NO]** button to release the mode immediately.

5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
 - (1) Set the disc in the unit. (Whichever recordable discs or discs for playback only are available)
 - (2) Turn the  (MD) knob and display “CPLAY2MODE” (C36).
 - (3) Press the  button to change the display to “CPLAY2MID”.
 - (4) When access completes, the display changes to “C = 0000 AD = 00”.

Note: The numbers “0” displayed show you error rates and ADER.

2. Changing the parts to be played back

- (1) Press the  button during continuous playback to change the display as below.



When pressed another time, the parts to be played back can be moved.

- (2) When access completes, the display changes to “C = 0000 AD = 00”.

Note: The numbers “0” displayed show you error rates and ADER.

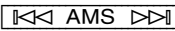
3. Ending the continuous playback mode

- (1) Press the  button. The display will change to “CPLAY2MODE” (C36).
- (2) Press the  button and take out the disc.

Note: The playback start addresses for IN, MID, and OUT are as follows.

IN 40h cluster
 MID 300h cluster
 OUT 700h cluster

5-2. Operating the Continuous Recording Mode (Use only when performing self-recording/palyback check)

1. Entering the continuous recording mode
 - (1) Set a recordable disc in the unit.
 - (2) Turn the  (MD) knob and display “CREC 2MODE” (C37).
 - (3) Press the  button to change the display to “CREC 2MID”.
 - (4) When access completes, the display changes to “CREC (0000)” and “ ” lights up.

Note: The numbers “0” displayed shows you the recording position addresses.

2. Changing the parts to be recorded

- (1) When the  button is pressed during continuous recording, the display changes as below.



When pressed another time, the parts to be recorded can be changed. “ ” goes off.

- (2) When access completes, the display changes to “CREC (0000)” and “ ” lights up.

Note: The numbers “0” displayed shows you the recording position addresses.

3. Ending the continuous recording mode

- (1) Press the  button. The display changes to “CREC 2MODE” (C37) and “ ” goes off.
- (2) Press the  button and take out the disc.

Note 1: The recording start addresses for IN, MID, and OUT are as follows.

IN 40h cluster
 MID 300h cluster
 OUT 700h cluster

Note 2: The  button can be used to stop recording anytime.

Note 3: Do not perform continuous recording for long periods of time above 5 minutes.

Note 4: During continuous recording, be careful not to apply vibration.

6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
 (MD)	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
 (MD)	Stops continuous playback and continuous recording.
 (MD)	The sled moves to the outer circumference only when this is pressed.
 (MD)	The sled moves to the inner circumference only when this is pressed.
REC MODE	Switches between the pit and groove modes when pressed.
PLAY MODE (MD)	Switches the spindle servo mode (CLV S ↔ CLV A).
DISPLAY	Switches the displayed contents each time the button is pressed
	Ejects the disc
	Releases the test mode

7. TEST MODE DISPLAYS

Each time the **DISPLAY** button is pressed, the display changes in the following order.

When CPLAY and CREC are started, the display will forcibly be switched to the error rate display as the initial mode.

1. Mode display

Displays “TEMP ADJUST” (C03), “CPLAY2MODE” (C36), etc.

2. Error rate display

Displays the error rate in the following way.

C = 0000 AD = 00

C = : Indicates the C1 error.

AD = : Indicates ADER.

3. Address display

The address is displayed as follows. (MO: recordable disc, CD: playback only disc)

h = 0000 s = 0000 (MO pit and CD)

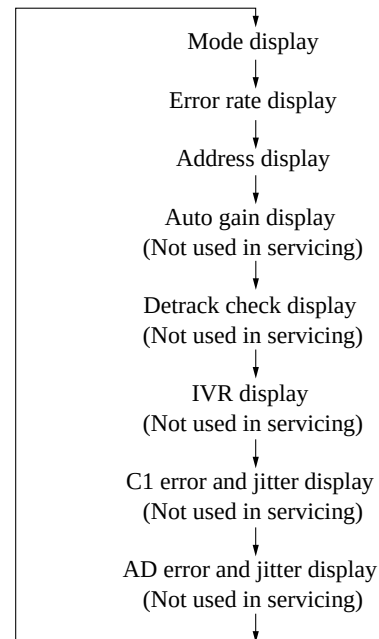
h = 0000 a = 0000 (MO groove)

h = Indicates the header address.

s = Indicates the SUBQ address.

a = Indicates the ADIP address.

Note: “—” is displayed when servo is not imposed.



MEANINGS OF OTHER DISPLAYS

Display	Contents	
	When Lit	When Off
▶	Servo ON	Servo OFF
II	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
TOC EDIT	CLV low speed mode	CLV normal mode
L.SYNC	ABCD adjustment completed	
OVER	Tracking offset cancel ON	Tracking offset cancel OFF
B/1	Tracking auto gain OK	
A-REP	Focus auto gain OK	
TRACK/(LP4)/calendar frame	Pit	Groove
DISC/LP2	High reflection	Low reflection
SHUF	CLV S	CLV A
MONO	CLV LOCK	CLV UNLOCK

8. AUTOMATIC SELF-DIAGNOSIS FUNCTION

This test mode performs CREC and CPLAY automatically for mainly checking the characteristics of the optical pick-up. To perform this test mode, the laser power must first be checked. Perform AUTO CHECK after the laser power check and Iop check.

Procedure:

1. Press the **[YES]** button. If “LDPWR ミチェック ” is displayed, it means that the laser power check has not been performed. In this case, perform the laser power check and Iop compare, and then repeat from step 1.
2. If a disc is in the mechanical deck, it will be ejected forcibly.
“DISC IN” will be displayed in this case. Load a test disc (MDW-74/GA-1) which can be recorded.
3. If a disk is loaded at step 2, the check will start automatically.
4. When “XX CHECK” is displayed, the item corresponding to XX will be performed.
When “06 CHECK” completes, the disc loaded at step 2 will be ejected. “DISC IN” will be displayed. Load the check disc (MD) TDYS-1.
5. When the disc is loaded in step 4, the check will automatically be resumed from “07 CHECK”.
6. After completing to test item 12, check OK or NG will be displayed. If all items are OK, “CHECK ALL OK” will be displayed. If any item is NG, it will be displayed as “NG:xxxx”.

When “CHECK ALL OK” is displayed, it means that the optical pick-up is normal. Check the operations of the other spindle motor, thread motor, etc.

When displayed as “NG:xxxx”, it means that the optical pick-up is faulty. In this case, replace the optical pick-up.

9. INFORMATION

Display the software version.

Procedure:

1. If displayed as “INFORMATION”, press the **[YES]** button.
2. The software version will be displayed.
3. Press the **[MENU/NO]** button to end this mode.

10. WHEN MEMORY NG IS DISPLAYED

If the nonvolatile memory data is abnormal, “E0001/MEMORY NG” will be displayed so that the MD deck does not continue operations. In this case, set the test mode promptly and perform the following procedure.

Procedure:

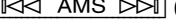
1. Set the test mode (refer to page 28).
2. Normally a message for selecting the test mode will be displayed. However if the nonvolatile memory is abnormal, the following will be displayed “INIT EEP?”.
3. Press the **[MD]** button and **[EJECT]** button together.
4. Rotate the **[◀ AMS ▶]** (MD) knob and select MDM-7X2A.
5. Press the **[◀ AMS ▶]** (MD) knob. If the nonvolatile memory is successfully overwritten, the normal test mode will be set and a message to select the test mode will be displayed.

CD SECTION

Set the CD test mode when performing confirmations (refer to page 12).
After completing confirmation, release the CD test mode.

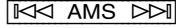
1. COMMAND TRANSFER MENU

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “0> COMMAND”, and press the  (MD) knob.
- (2) Select a command with  (MD) knob, and press the  (MD) knob to set.
- (3) Select the edit position with  (MD) and  (MD) buttons, and rotate  (MD) knob for editing, then press the  (MD) knob for transfer.
- (4) To exit from this mode, press the  button.

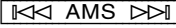
2. C1, C2 ERROR DISPLAY

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “1> ERROR”, and press the  (MD) knob.
- (2) C1 error and C2 error are displayed on the left side and right side with 4-digit codes respectively.
- (3) To exit from this mode, press the  button.

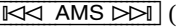
3. DISC SPEED SELECTION

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “2> SPEED ×1”, and press the  (MD) knob.
- (2) Each time the  (MD) knob is pressed, the speed changes over such as ×1 → ×2 → ×4 → ×1.
- (3) To exit from this mode, press the  button.

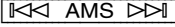
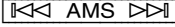
4. CHECK 8 DISPLAY

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “4> CHECK 8”, and press the  (MD) knob.
- (2) The time from spindle kick to GFS detect is displayed.
- (3) To exit from this mode, press the  button.

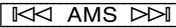
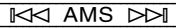
5. PORT SELECTION

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “7> PORT”, and press the  (MD) knob.
- (2) Rotate the  (MD) knob to select GFS, ERROR RATE, RFCK and press the  (MD) knob to set.
- (3) To exit from this mode, press the  button.

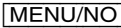
6. AMS ON/OFF

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “8> AMS ON”, and press the  (MD) knob.
- (2) Switch the high speed ON/OFF of the track jump.
- (3) To exit from this mode, press the  button.

7. TRK ON/OFF

Procedure:

- (1) Enter the test mode, then rotate  (MD) knob to display “9> TRK ON”, and press the  (MD) knob.
- (2) Switch the tracking servo ON/OFF.
- (3) To exit from this mode, press the  button.

SECTION 5 ELECTRICAL ADJUSTMENTS

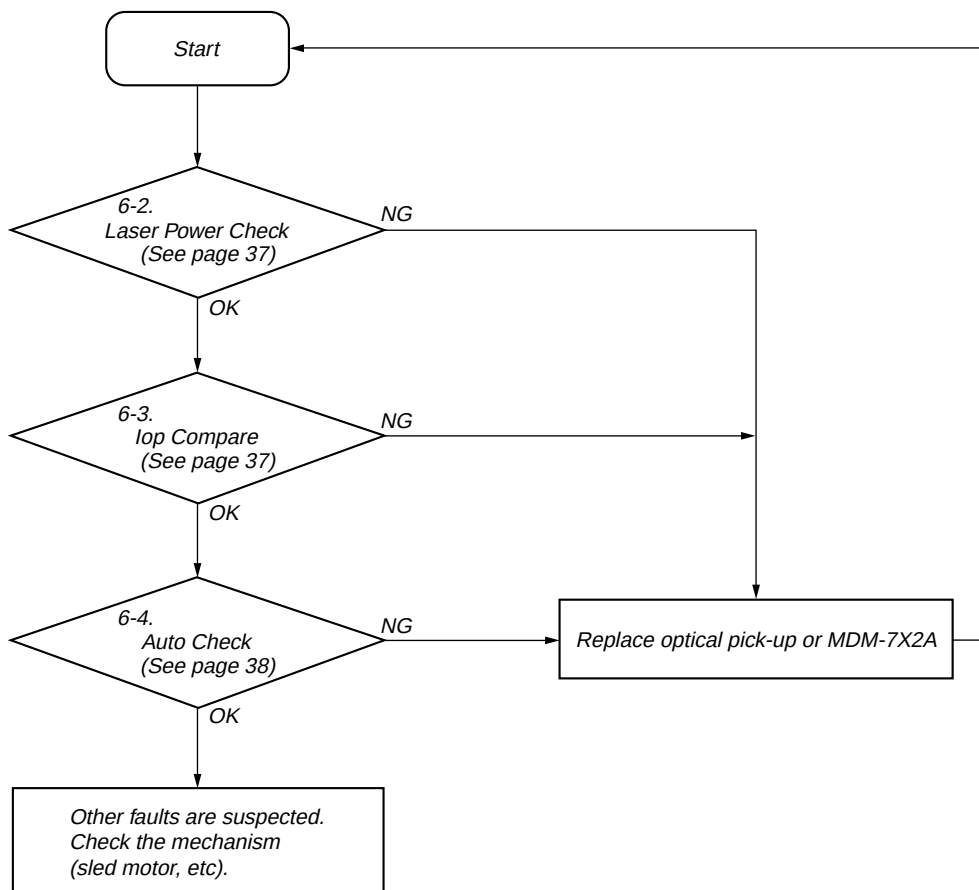
MD SECTION

Note: MD always plays double speed.

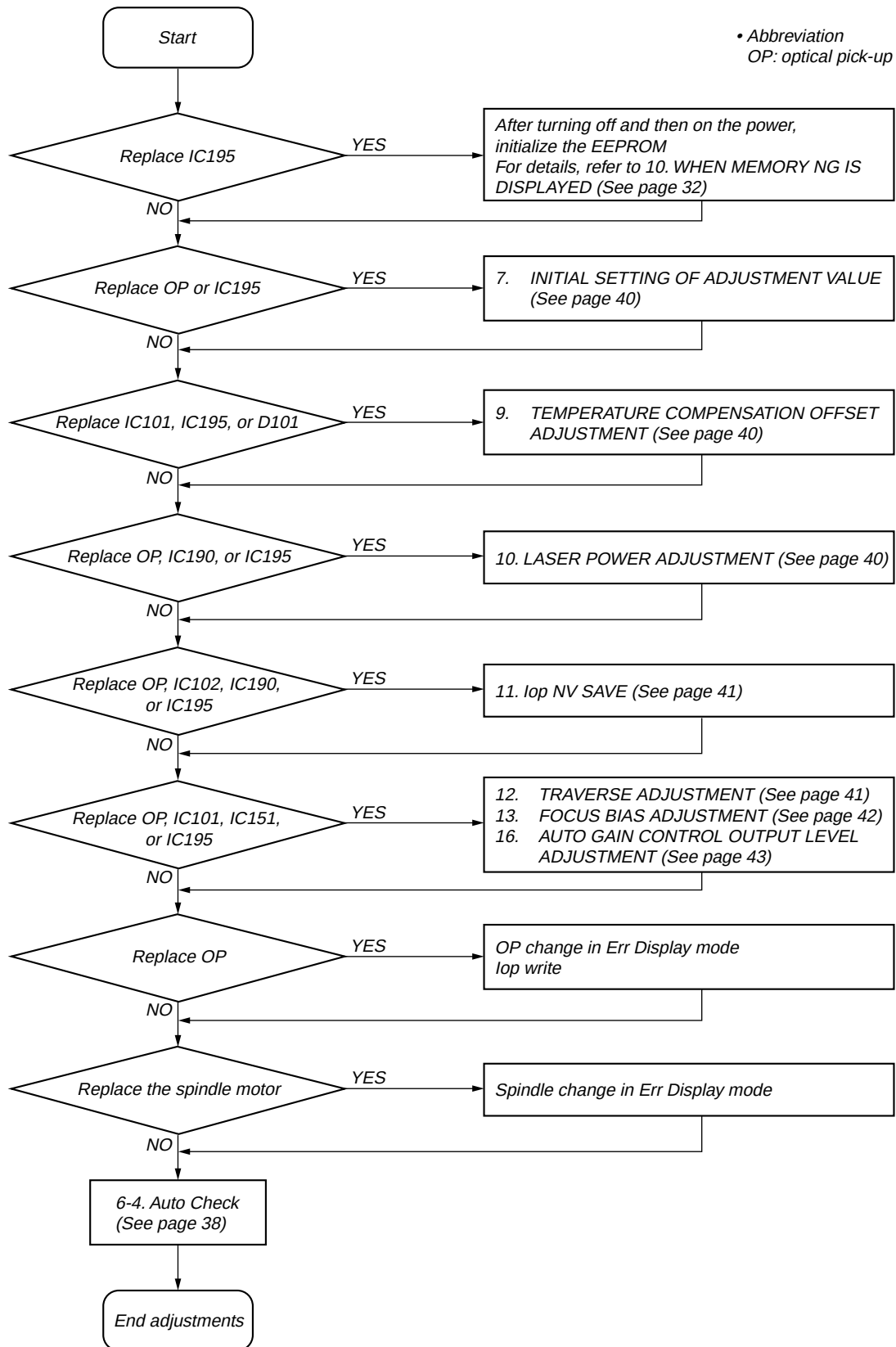
1. PARTS REPLACEMENT AND ADJUSTMENT

If malfunctions caused by Optical pick-up such as sound skipping are suspected, follow the following check.

Check before replacement



Adjustment flow

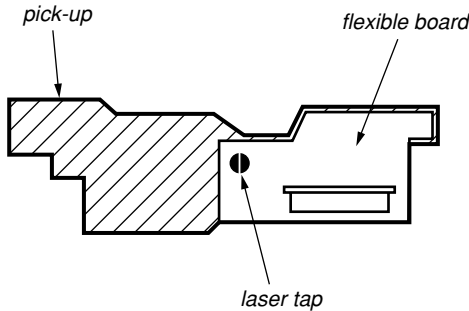


2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

3. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-262A)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



Optical pick-up flexible board

4. PRECAUTIONS FOR ADJUSTMENTS

- When replacing the following parts, perform the adjustments and checks with ○ in the order shown in the following table.
- Set the test mode when performing adjustments. After completing the adjustments, exit the test mode. Perform the adjustments and checks in “group Service” of the test mode.
- Perform the adjustments to be needed in the order shown.
- Use the following tools and measuring devices.
 - Check Disc (MD) TDYS-1 (Parts No. 4-963-646-01)
 - Test Disk (MDW-74/GA-1) (Parts No. 4-229-747-01)
 - Laser power meter LPM-8001 (Parts No. J-2501-046-A) or MD Laser power meter 8010S (Parts No. J-2501-145-A)*1
 - Oscilloscope (Measure after performing CAL of prove.)
 - Digital voltmeter
 - Thermometer
 - Jig for checking BD (MD) board waveform (Parts No. : J-2501-196-A)

- When observing several signals on the oscilloscope, etc., make sure that VC and ground do not connect inside the oscilloscope. (VC and ground will become short-circuited.)
- Using the above jig enables the waveform to be checked without the need to solder. (Refer to Servicing Note on page 9.)
- As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.

*1 Laser power meter

When performing laser power checks and adjustment (electrical adjustment), use of the new MD laser power meter 8010S (Part No. J-2501-145-A) instead of the conventional laser power meter is convenient.

It sharply reduces the time and trouble to set the laser power meter sensor onto the objective lens of optical pick-up.

Adjustment	Parts to be replaced						
	Optical Pick-up	IC101	IC102	IC151	IC190	IC195	D101
7. Initial setting of adjustment value	○	×	×	×	×	○	×
8. Recording of Iop information	○	×	×	×	×	○	×
9. Temperature compensation offset adjustment	×	○	×	×	×	○	○
10. Laser power adjustment	○	×	×	×	○	○	×
11. Iop NV Save	○	×	○	×	○	○	×
12. Traverse adjustment	○	○	×	○	×	○	×
13. Focus bias adjustment	○	○	×	○	×	○	×
16. Auto gain adjustment	○	○	×	○	×	○	×
6-4. AUTO CHECK	○	○	×	○	○	○	×

5. USING THE CONTINUOUSLY RECORDED DISC

* This disc is used in focus bias adjustment and error rate check. The following describes how to create a continuous recording disc.

1. Insert a disc (blank disc) commercially available.
2. Rotate the **[◀◀ AMS ▶▶]** (MD) knob and display "CREC 2MODE" (C37).
3. Press the **[YES]** button again to display "CREC 2MID". Display "CREC (0300)" and start to recording.
4. Complete recording within 5 minutes.
5. Press the **[MENU/NO]** button and stop recording .
6. Press the **[EJECT]** button and remove the disc.

The above has been how to create a continuous recorded data for the focus bias adjustment and error rate check.

Note: Be careful not to apply vibration during continuous recording.

6. CHECKS PRIOR TO REPAIRS

These checks are performed before replacing parts according to "approximate specifications" to determine the faulty locations. For details, refer to "Checks Prior to Parts Replacement and Adjustments" (see page 11).

6-1. Temperature Compensation Offset Check

When performing adjustments, set the internal temperature and room temperature to 22 to 28°C.

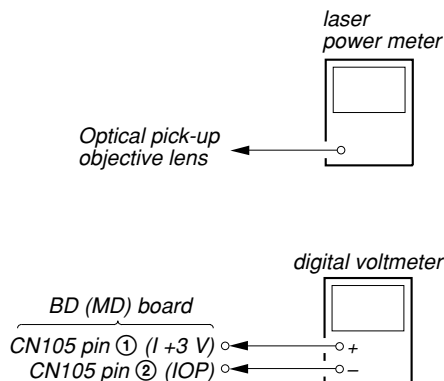
Checking Procedure:

1. Rotate the **[◀◀ AMS ▶▶]** (MD) knob to display "TEMP CHECK" (C12).
2. Press the **[YES]** button.
3. "T=@@ (##) [OK]" should be displayed. If "T=@@ (##) [NG]" is displayed, it means that the results are bad. (@@ indicates the current value set, and ## indicates the value written in the non-volatile memory.)

6-2. Laser Power Check

Before checking, check the Iop value of the optical pick-up. (Refer to 8. Recording and Displaying the Iop Information (see page 40).)

Connection:



Checking Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the **[◀◀]** button or **[▶▶]** button to move the optical pick-up.) Connect the digital volt meter to CN105 pin ① (I+3V) and CN105 pin ② (IOP).
2. Then, rotate the **[◀◀ AMS ▶▶]** (MD) knob and display "LDPWR CHECK" (C13).
3. Press the **[YES]** button once and display "LD 0.9 mW \$ 000". Check that the reading of the laser power meter become 0.84 to 0.92 mW.
4. Press the **[YES]** button once more and display " LD 8.4 mW \$ 000". Check that the reading the laser power meter and digital volt meter satisfy the specified value.

Specified Value:

Laser power meter reading : 8.4 ± 0.3 mW

Digital voltmeter reading : Optical pick-up displayed value $\pm 10\%$

(Optical pick-up label)

KMS262A
20101
B0825

(For details of the method for checking this value, refer to "8. Recording and Displaying the Iop Information".)

Iop = 82.5 mA in this case

Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

5. Press the **[MENU/NO]** button and display "LDPWR CHECK" (C13) and stop the laser emission. (The **[MENU/NO]** button is effective at all times to stop the laser emission.)

Note: After step 4, each time the **[YES]** button is pressed, the display will be switched between "LD 0.7 mW \$ 000", "LD 7.5 mW \$ 000", and "LD Wp ホセ イ \$ 000". Nothing needs to be performed here.

Check Location: BD (MD) board (see page 44)

6-3. Iop Compare

The current Iop value at laser power 7 mW output and reference Iop value (set at shipment) written in the nonvolatile memory are compared, and the rate of increase/decrease will be displayed in percentage.

Note: Perform this function with the optical pick-up set at room temperature.

Procedure:

1. Rotate the **[◀◀ AMS ▶▶]** (MD) knob to display "Iop Compare" (C27).
2. Press the **[YES]** button and start measurements.
3. When measurements complete, the display changes to "±xx%yy".
xx is the percentage of increase/decrease, and OK or NG is displayed at yy to indicate whether the percentage of increase/decrease is within the allowable range.
4. Press the **[MENU/NO]** button to end this mode.

6-4. Auto Check

This test mode performs CREC and CPLAY automatically for mainly checking the characteristics of the optical pick-up. To perform this test mode, the laser power must first be checked. Perform Auto Check after the laser power check and Iop compare.

Procedure:

1. Press the **[YES]** button. If “LDPWR ミチェック” is displayed, it means that the laser power check has not been performed. In this case, perform the laser power check and Iop compare, and then repeat from step 1.
2. If a disc is in the mechanical deck, it will be ejected forcibly. “DISC IN” will be displayed in this case. Load a test disc (MDW-74/GA-1) which can be recorded.
3. If a disk is loaded at step 2, the check will start automatically.
4. When “XX CHECK” is displayed, the item corresponding to XX will be performed.
When “06 CHECK” completes, the disc loaded at step 2 will be ejected. “DISC IN” will be displayed. Load the check disc (MD) TDYS-1.
5. When the disc is loaded, the check will automatically be resumed from “07 CHECK”.
6. After completing to test item “12 check”, check OK or NG will be displayed. If all items are OK, “CHECK ALL OK” will be displayed. If any item is NG, it will be displayed as “NG:xxxx”.

When “CHECK ALL OK” is displayed, it means that the optical pick-up is normal. Check the operations of the other spindle motor, sled motor, etc.

When displayed as “NG:xxxx”, it means that the optical pick-up is faulty. In this case, replace the optical pick-up.

6-5. Other Checks

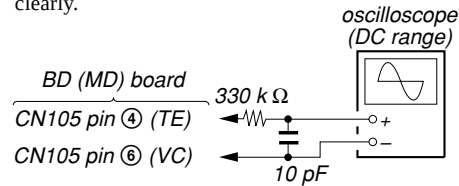
All the following checks are performed by the Auto Check mode. They therefore need not be performed in normal operation.

- 6-6. Traverse Check
- 6-7. Focus Bias Check
- 6-8. C PLAY Check
- 6-9. Self-Recording/Playback Check

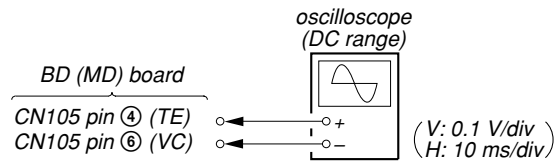
6-6. Traverse Check

Note 1: Data will be erased during MO reading if a recorded disc is used in this adjustment.

Note 2: If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



Connection:



Checking Procedure:

1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) on the BD (MD) board.
2. Load a disc (any available on the market). (Refer to Note 1)
3. Press the **[▶▶]** (MD) button to move the optical pick-up outside the pit.
4. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display “EF MO CHECK”(C14).
5. Press the **[YES]** button to display “EFB = ◻ MO-R”.
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the **[◀◀ AMS ▶▶]** (MD) knob.
(Read power traverse checking)

Traverse Waveform



Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

7. Press the **[YES]** button to display “EFB = ◻ MO-W”.
8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the **[◀◀ AMS ▶▶]** (MD) knob.
(Write power traverse checking)

Traverse Waveform

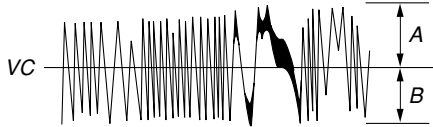


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

9. Press the **[YES]** button to display "EFB = $\square\square$ MO-P".
Then, the optical pick-up moves to the pit area automatically and servo is imposed.
10. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the **[◀◀ AMS ▶▶]** (MD) knob.

Traverse Waveform

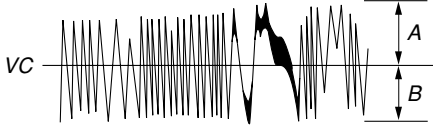


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

11. Press the **[YES]** button to display "EF MO CHECK (C14)".
The disc stops rotating automatically.
12. Press the **[EJECT]** button and take out the disc.
13. Load the check disc (MD) TDYS-1.
14. Turn the **[◀◀ AMS ▶▶]** (MD) knob and display "EF CD CHECK" (C15).
15. Press the **[YES]** button to display "EFB = $\square\square$ CD". Servo is imposed automatically.
16. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the **[◀◀ AMS ▶▶]** (MD) knob.

Traverse Waveform



Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

17. Press the **[YES]** button to display "EF CD CHECK" (C15).
18. Press the **[EJECT]** button and take out the check disc (MD) TDYS-1.

Check Location: BD (MD) board (see page 44)

6-7. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

Checking Procedure:

1. Load the test disk (MDW-74/GA-1).
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **[YES]** button to display "CPLAY2MID".
4. Press the **[MENU/NO]** button when "C = $\square\square\square\square$ AD = $\square\square$ " is displayed.
5. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display "FBIAS CHECK" (C16).
6. Press the **[YES]** button to display " $\square\square\square\square/\square\square$ c = $\square\square$ ".
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
Check that the C1 error is below 20 and ADER is below 2.
7. Press the **[YES]** button to display " $\square\square\square\square/\square\square$ b = $\square\square$ ".
Check that the C1 error is about 100 and ADER is below 2.
8. Press the **[YES]** button to display " $\square\square\square\square/\square\square$ a = $\square\square$ ".
Check that the C1 error is about 100 and ADER is below 2.
9. Press the **[MENU/NO]** button, then press the **[EJECT]** button and take out the test disc.

6-8. C PLAY Check

MO Error Rate Check

Checking Procedure:

1. Load the test disk (MDW-74/GA-1).
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **[YES]** button to display "CPLAY2MID".
4. The display changes to "C = $\square\square\square\square$ AD = $\square\square$ ".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the test disc.

CD Error Rate Check

Checking Procedure:

1. Load the check disc (MD) TDYS-1.
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **[YES]** button to display "CPLAY2MID".
4. The display changes to "C = $\square\square\square\square$ AD = $\square\square$ ".
5. Check that the C1 error rate is below 20.
6. Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the check disc.

6-9. Self-Recording/playback Check

Prepare a continuous recording disc using the unit to be repaired and check the error rate.

Checking Procedure:

1. Load a recordable disc (blank disc).
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display "CREC 2MODE" (C37).
3. Press the **[YES]** button to display "CREC 2MID".
4. When recording starts, lights up "**REC**" and display "CREC 2 @@@@" (@@@@ is the address).
5. About 1 minute later, press the **[MENU/NO]** button to stop continuous recording.
6. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display "CPLAY2 MODE" (C36).
7. Press the **[YES]** button to display "CPLAY2MID".
8. "C = $\square\square\square\square$ AD = $\square\square$ " will be displayed.
9. Check that the C1 error becomes below 20 and the AD error below 2.
10. Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the disc.

7. INITIAL SETTING OF ADJUSTMENT VALUE

Note:

Mode which sets the adjustment results recorded in the non-volatile memory to the initial setting value. However the results of the temperature compensation offset adjustment will not change to the initial setting value.

If initial setting is performed, perform all adjustments again excluding the temperature compensation offset adjustment.

For details of the initial setting, refer to "4. Precautions for Adjustments" and execute the initial setting before the adjustment as required.

Setting Procedure:

1. Turn the **[◀◀AMS▶▶]** (MD) knob to display "ADJ CLEAR" (C28).
2. Press the **[YES]** button. "Complete!" will be displayed momentarily and initial setting will be executed, after which "ADJ CLEAR" (C28) will be displayed.

8. RECORDING AND DISPLAYING THE IOP INFORMATION

The Iop data can be recorded in the non-volatile memory. The Iop value on the optical pick-up label and the Iop value after the adjustment will be recorded. Recording these data eliminates the need to read the label on the optical pick-up.

Recording Procedure:

1. Turn the **[◀◀AMS▶▶]** (MD) knob to display "Iop Write" (C05), and press the **[YES]** button.
2. The display becomes "Ref=@@.@@" (@ is an arbitrary number) and the numbers which can be changed will blink.
3. Input the Iop value on the optical pick-up label.
To select the number : Turn the **[◀◀AMS▶▶]** (MD) knob.
To select the digit : Press the **[◀◀AMS▶▶]** (MD) knob
4. When the **[YES]** button is pressed, the display becomes "Measu=@@.@@" (@ is an arbitrary number).
5. As the adjustment results are recorded for the 4 value. Leave it as it is and press the **[YES]** button.
6. "Complete!!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write" (C05).

Display Procedure:

1. Turn the **[◀◀AMS▶▶]** (MD) knob to display "Iop Read" (C26), and press the **[YES]** button.
2. "@@.@./##.##" is displayed and the recorded contents are displayed.
@@.@ indicates the Iop value on the optical pick-up label.
##.## indicates the Iop value after adjustment
3. To end, press the **[◀◀AMS▶▶]** (MD) button or **[MENU/NO]** button to display "Iop Read" (C26).

9. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

Save the temperature data at that time in the non-volatile memory as 25 °C reference data.

Note:

1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 °C to 28 °C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature of 22 °C to 28 °C.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

Adjusting Procedure:

1. Turn the **[◀◀AMS▶▶]** (MD) knob to display "TEMP ADJUST" (C03).
2. Press the **[YES]** button to select the "TEMP ADJUST" mode.
3. "TEMP = 000 [OK]" and the current temperature data will be displayed.
4. To save the data, press the **[YES]** button.
When not saving the data, press the **[MENU/NO]** button.
5. When the **[YES]** button is pressed, "TEMP = 000 SAVE" will be displayed and turned back to "TEMP ADJUST" (C03) display then. When the **[MENU/NO]** button is pressed, "TEMP ADJUST" (C03) will be displayed immediately.

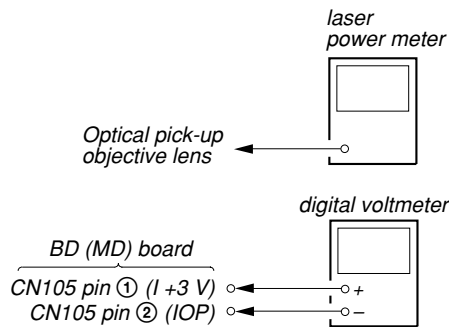
Specified Value:

The "TEMP = 000" should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

10. LASER POWER ADJUSTMENT

Check the Iop value of the optical pick-up before adjustments.
(Refer to 8. Recording and Displaying Iop Information)

Connection:



Adjusting Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the **[◀◀]** (MD) button or **[▶▶]** (MD) button to move the optical pick-up)
Connect the digital voltmeter to CN105 pin ① (I+3V) and CN105pin ② (IOP) on the BD (MD) board.
2. Turn the **[◀◀AMS▶▶]** (MD) knob to display "LDPWR ADJUST" (C04).
(Laser power : For adjustment)
3. Press the **[YES]** button once to display "LD 0.9 mW \$ 000".
4. Turn the **[◀◀AMS▶▶]** (MD) knob so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the **[YES]** button after setting the range knob of the laser power meter, and save the adjustment results. ("LD SAVE \$ 000" will be displayed for a moment)
5. Then "LD 8.4 mW \$ 000" will be displayed.

- Turn the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob so that the reading of the laser power meter becomes 8.2 to 8.6 mW, press the YES button to save it.

Note: Do not perform the emission with 7.0 mW more than 15 seconds continuously.

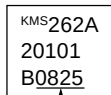
- Then, turn the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob to display "LDPWR CHECK" (C13).
- Press the YES button once to display "LD 0.9 mW \$ $\square\square\square$ ". Check that the reading of the laser power meter become 0.85 to 0.91 mW.
- Press the YES button once more to display "LD 8.4 mW \$ $\square\square\square$ ". Check that the reading of the laser power meter and digital voltmeter satisfy the specified value.
Note down the digital voltmeter reading value.

Specified Value:

Laser power meter reading: 8.4 ± 0.3 mW

Digital voltmeter reading : Value on the optical pick-up label $\pm 10\%$

(Optical pick-up label)



(For details of the method for checking this value, refer to "8. Recording and Displaying the Iop Information".)

$I_{op} = 82.5$ mA in this case

$I_{op} \text{ (mA)} = \text{Digital voltmeter reading (mV)} / 1 \text{ (}\Omega\text{)}$

- Press the MENU/NO button to display "LDPWR CHECK" (C13) and stop the laser emission.
(The MENU/NO button is effective at all times to stop the laser emission.)
- Turn the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob to display "Iop Write" (C05).
- Press the YES button. When the display becomes $\text{Ref} = @@@.@$ (@ is an arbitrary number), press the YES button to display " $\text{Measu} = @@@.@$ " (@ is an arbitrary number).
- The numbers which can be changed will blink. Input the Iop value noted down at step 9.
To select the number : Turn the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob.
To select the digit : Press the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob.
- When the YES button is pressed, "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write" (C05).

Note: After step 4, each time the YES button is pressed, the display will be switched "LD 0.7 mW \$ $\square\square\square$ ", "LD 7.5 mW \$ $\square\square\square$ ", and "LD Wp ホセイ $\square\square\square$ ". Nothing needs to be performed here.

Adjustment Location: BD (MD) board (see page 42)

11. Iop NV SAVE

Write the reference values in the nonvolatile memory to perform "Iop compare". As this involves rewriting the reference values, do not perform this procedure except when adjusting the laser power during replacement of the optical pick-up and when replacing the IC102. Otherwise the optical pick-up check may deteriorate.

Note: Perform this function with the optical pick-up set at room temperature.

Procedure:

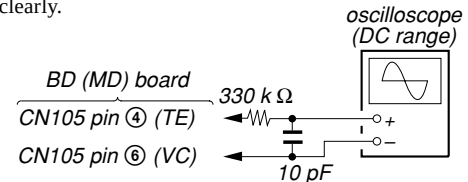
- Rotate the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob to display "Iop NV Save" (C06).
- Press the YES button and display "Iop [stop]".
- After the display changes to "Iop = xxsave?", press the YES button.

- After "Complete!" is displayed momentarily, the display changes to "Iop 7.0 mW".
- After the display changes to "Iop=yysave?", press the YES button.
- When "Complete!" is displayed, it means that Iop NV saving has been completed.

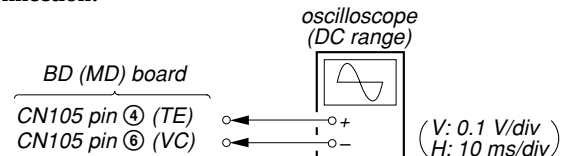
12. TRAVERSE ADJUSTMENT

Note 1: Data will be erased during MO reading if a recorded disc is used in this adjustment.

Note 2: If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



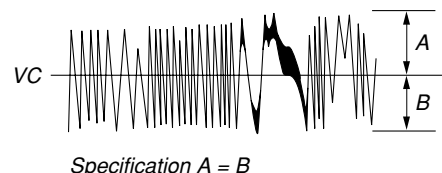
Connection:



Adjusting Procedure:

- Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) on the BD (MD) board.
- Load a disc (any available on the market). (Refer to Note 1)
- Press the $\blacktriangleright$ (MD) button to move the optical pick-up outside the pit.
- Turn the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob to display "EF MO ADJUST" (C07).
- Press the YES button to display "EFB = $\square\square\square$ MO-R".
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
- Turn the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob so that the waveform of the oscilloscope becomes the specified value.
(When the $\llcorner \llcorner \text{AMS} \gg \gg \lrcorner$ (MD) knob is turned, the $\square\square\square$ of "EFB = $\square\square\square$ " changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Read power traverse adjustment)

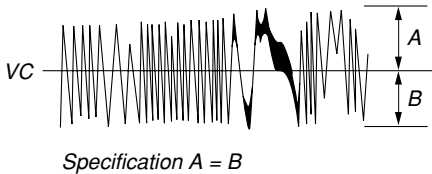
Traverse Waveform



- Press the YES button and save the result of adjustment to the non-volatile memory ("EFB = $\square\square\square$ SAVE" will be displayed for a moment. Then "EFB = $\square\square\square$ MO-W" will be displayed).

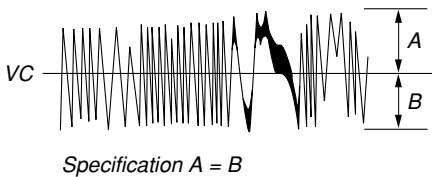
8. Turn the **AMS** (MD) knob so that the waveform of the oscilloscope becomes the specified value.
(When the **AMS** (MD) knob is turned, the "EFB=" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Write power traverse adjustment)

Traverse Waveform



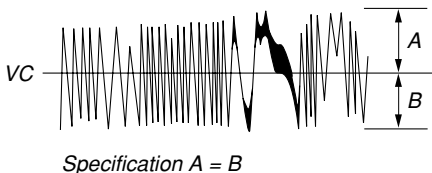
9. Press the **YES** button, and save the adjustment results in the non-volatile memory. ("EFB = SAVE" will be displayed for a moment)
10. "EFB = MO-P" will be displayed.
The optical pick-up moves to the pit area automatically and servo is imposed.
11. Turn the **AMS** (MD) knob until the waveform of the oscilloscope moves closer to the specified value.
In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

Traverse Waveform



12. Press the **YES** button, and save the adjustment results in the non-volatile memory. ("EFB = SAVE" will be displayed for a moment.)
Next "EF MO ADJUST" (C07) is displayed. The disc stops rotating automatically.
13. Press the **EJECT** button and take out the disc.
14. Load the check disc (MD) TDYS-1.
15. Turn the **AMS** (MD) knob to display "EF CD ADJUST" (C08).
16. Press the **YES** button to display "EFB = CD". Servo is imposed automatically.
17. Turn the **AMS** (MD) knob so that the waveform of the oscilloscope moves closer to the specified value.
In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

Traverse Waveform



18. Press the **YES** button, display "EFB = SAVE" for a moment and save the adjustment results in the non-volatile memory.
Next "EF CD ADJUST" (C08) will be displayed.
19. Press the **EJECT** button and take out the disc (MD) TDYS-1.

Adjustment Location: BD (MD) board (see page 44)

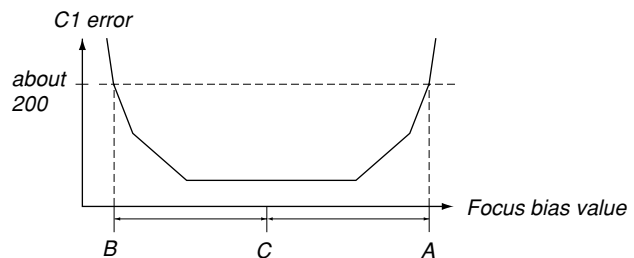
13. FOCUS BIAS ADJUSTMENT

Adjusting Procedure:

1. Load the continuously-recorded disc. (Refer to "5. USING THE CONTINUOUSLY RECORDED DISC")
2. Turn the **AMS** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **YES** button to display "CPLAY2MID".
4. Press the **MENU/NO** button when "C = 0000 AD = 00" is displayed.
5. Turn the **AMS** (MD) knob to display "FBIAS ADJUST" (C09).
6. Press the **YES** button to display "0000/00 a = 00".
The first four digits indicate the C1 error rate, the two digits after "/" indicate ADER, and the 2 digits after "a =" indicate the focus bias value.
7. Turn the **AMS** (MD) knob clockwise and find the focus bias value at which the C1 error rate becomes about 220 (refer to Note 2).
8. Press the **YES** button to display "0000/00 b = 00".
9. Turn the **AMS** (MD) knob counterclockwise and find the focus bias value at which the C1 error rate becomes about 200.
10. Press the **YES** button to display "0000/00 c = 00".
11. Check that the C1 error rate is below 20 and ADER is 00. Then press the **YES** button.
12. If the "(00)" in "00 - 00 - 00 (00)" is above 20, press the **YES** button.
If below 20, press the **MENU/NO** button and repeat the adjustment from step 2.
13. Press the **EJECT** button and take out the disc.

Note 1: The relation between the C1 error and focus bias is as shown in the following figure. Find points A and B in the following figure using the above adjustment. The focal point position C is automatically calculated from points A and B.

Note 2: As the C1 error rate changes, perform the adjustment using the average value.



14. ERROR RATE CHECK

14-1. CD Error Rate Check

Checking Procedure:

1. Load the check disc (MD) TDYS-1.
2. Turn the **◀◀ AMS ▶▶** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **YES** button twice and display "CPLAY2MID".
4. The display changes to "C = 0000 AD = 00".
5. Check that the C1 error rate is below 20.
6. Press the **MENU/NO** button to stop playback, then press the **EJECT** button and take out the check disc.

14-2. MO Error Rate Check

Checking Procedure:

1. Load the continuously-recorded disc. (Refer to "5. USING THE CONTINUOUSLY RECORDED DISC")
2. Turn the **◀◀ AMS ▶▶** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **YES** button to display "CPLAY2MID".
4. The display changes to "C = 0000 AD = 00".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the **MENU/NO** button to stop playback, then press the **EJECT** button and take out the test disc.

15. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

Checking Procedure:

1. Load the continuously-recorded disc. (Refer to "5. USING THE CONTINUOUSLY RECORDED DISC")
2. Turn the **◀◀ AMS ▶▶** (MD) knob to display "CPLAY2 MODE" (C36).
3. Press the **YES** button twice to display "CPLAY2MID".
4. Press the **MENU/NO** button when "C = 0000 AD = 00" is displayed.
5. Turn the **◀◀ AMS ▶▶** (MD) knob to display "FBIAS CHECK" (C16).
6. Press the **YES** button to display "0000/00 c = 00".
The first four digits indicate the C1 error rate, the two digits after "/" indicate ADER, and the 2 digits after "c =" indicate the focus bias value.
Check that the C1 error is below 20 and ADER is below 2.
7. Press the **YES** button and display "0000/00 b = 00".
Check that the C1 error is about 100 and ADER is below 2.
8. Press the **YES** button and display "0000/00 a = 00".
Check that the C1 error is about 100 and ADER is below 2.
9. Press the **MENU/NO** button, then press the **EJECT** button and take out the disc.

Note: If the C1 error and ADER are above other than the specified value at points a (step 8. in the above) or b (step 7. in the above), the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

16. AUTO GAIN CONTROL OUTPUT LEVEL ADJUSTMENT

Be sure to perform this adjustment when the optical pick-up is replaced.

If the adjustment results becomes "Adjust NG!", the optical pick-up may be faulty or the servo system circuits may be abnormal.

16-1. CD Auto Gain Control Output Level Adjustment

Adjusting Procedure:

1. Load the check disc (MD) TDYS-1.
2. Turn the **◀◀ AMS ▶▶** (MD) knob to display "AG Set (CD)" (C11).
3. When the **YES** button is pressed, the adjustment will be performed automatically.
"Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (CD)" (C11).
4. Press the **EJECT** button and take out the check disc.

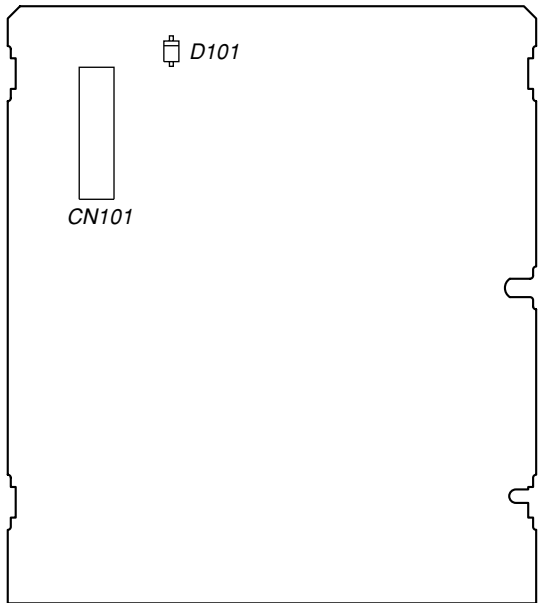
16-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure:

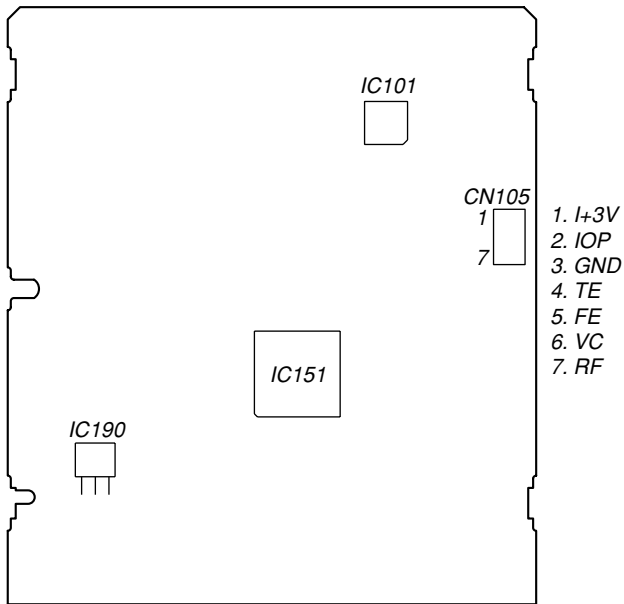
1. Load the test disc (MDW-74/GA-1).
2. Turn the **◀◀ AMS ▶▶** (MD) knob to display "AG Set (MO)" (C10).
3. When the **YES** button is pressed, the adjustment will be performed automatically.
"Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (MO)" (C10).
4. Press the **EJECT** button and take out the test disc.

Adjustment and checking Location:

– BD (MD) BOARD (Side A) –



– BD (MD) BOARD (Side B) –



Note: It is useful to use the jig for checking the waveform. (Refer to Servicing Notes on page 9)

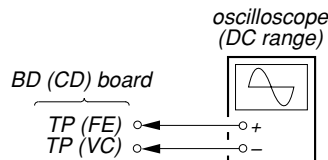
CD SECTION

Note:

1. CD Block is basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than $10M\Omega$ impedance.
4. Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.
5. Level doesn't change whichever with normal speed or with four times speed.

S Curve Check

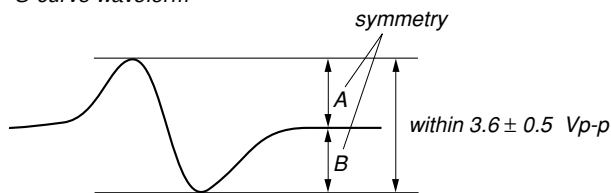
Connection:



Procedure:

1. Connect oscilloscope to test point TP (FE) and TP (VC) on BD (CD) board.
2. Turn ON the power.
3. Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
4. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 3.6 ± 0.5 Vp-p.

S-curve waveform

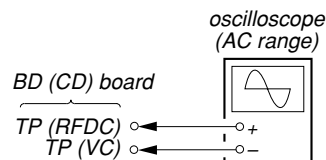


- Note:**
- Try to measure several times to make sure than the ratio of A : B or B : A is more than 10 : 7.
 - Take sweep time as long as possible and light up the brightness to obtain best waveform.

Check Location: BD (CD) board (see page 46)

RF Level Check

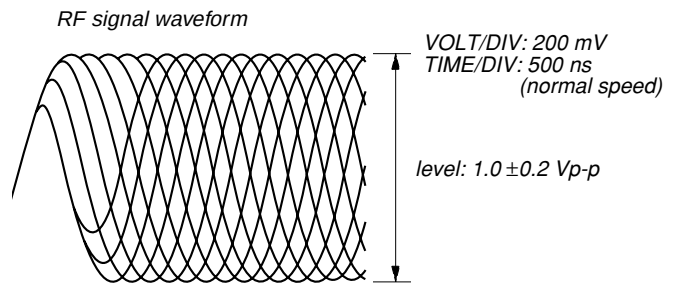
Connection:



Procedure:

1. Connect oscilloscope to test point TP (RFDC) and TP (VC) on BD (CD) board.
2. Turn ON the power.
3. Put disc (YEDS-18) in to play the number five track.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

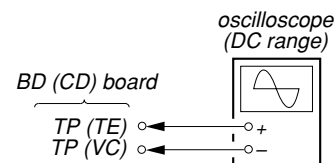
Note: A clear RF signal waveform means that the shape “ $\diamond$ ” can be clearly distinguished at the center of the waveform.



Checking Location: BD (CD) board (see page 46)

E-F Balance Check

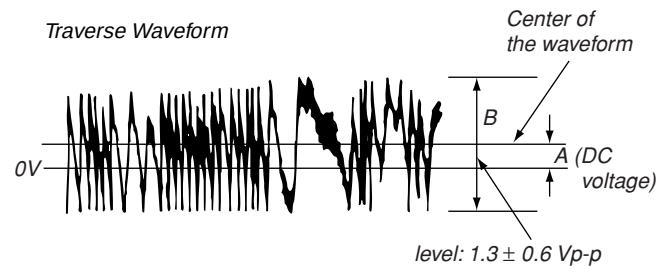
Connection:



Procedure:

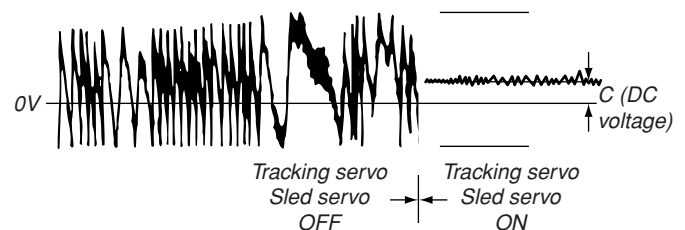
1. Connect oscilloscope to test point TP (TE) and TP (VC) on BD (CD) board.
2. Turn ON the power.
3. Put disc (YEDS-18) in to play the number five track.
4. Press the $\lll \lll \text{AMS} \ggg \ggg$ (MD) knob to display “9> TRK ON” at the service mode. (The tracking servo and the sledding servo are turned OFF)
5. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform. Confirm the following :
 $A/B \times 100 = \text{less than } \pm 22\%$

Traverse Waveform



6. Press the $\lll \lll \text{AMS} \ggg \ggg$ (MD) knob. (The tracking servo and sledding servo are turned ON)
 Confirm the C (DC voltage) is almost equal to the A (DC voltage) is step 5.

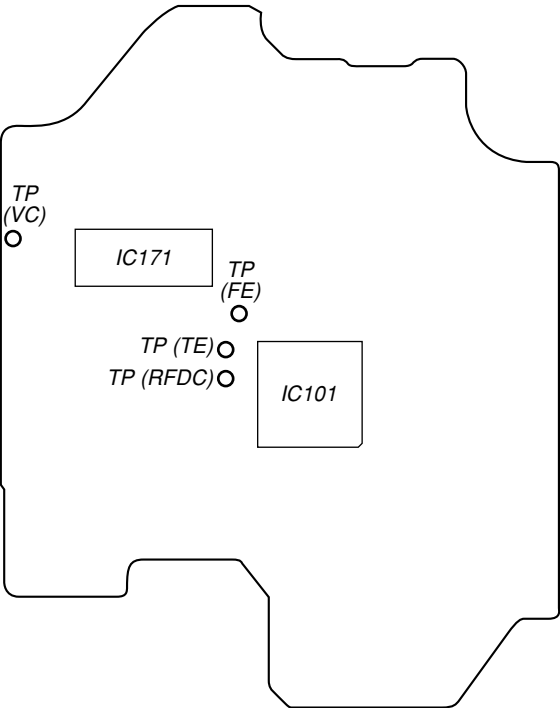
Traverse Waveform



Checking Location: BD (CD) board (see page 46)

Checking Location:

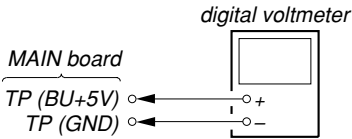
– BD (CD) BOARD (Side B) –



Voltage Adjustment

When replacing the base unit (BU-21BD53), mounted MAIN board and IC506, R550, R551, or RV500 on the MAIN board, perform the adjustment with the following procedure.

Connection:



Adjustment procedure:

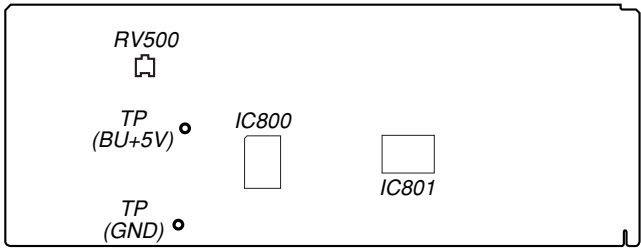
- 1. Connect the digital voltmeter to TP (BU+5V) and TP (GND) on the MAIN board.
- 2. Adjust the RV500 so that the reading of the digital voltmeter becomes 5.22 ± 0.04 V.

Specified Value:

Digital voltmeter reading: 5.22 ± 0.04 V

Adjustment Location:

– MAIN BOARD (Side A) –



6-1. BLOCK DIAGRAM - MD SERVO Section -

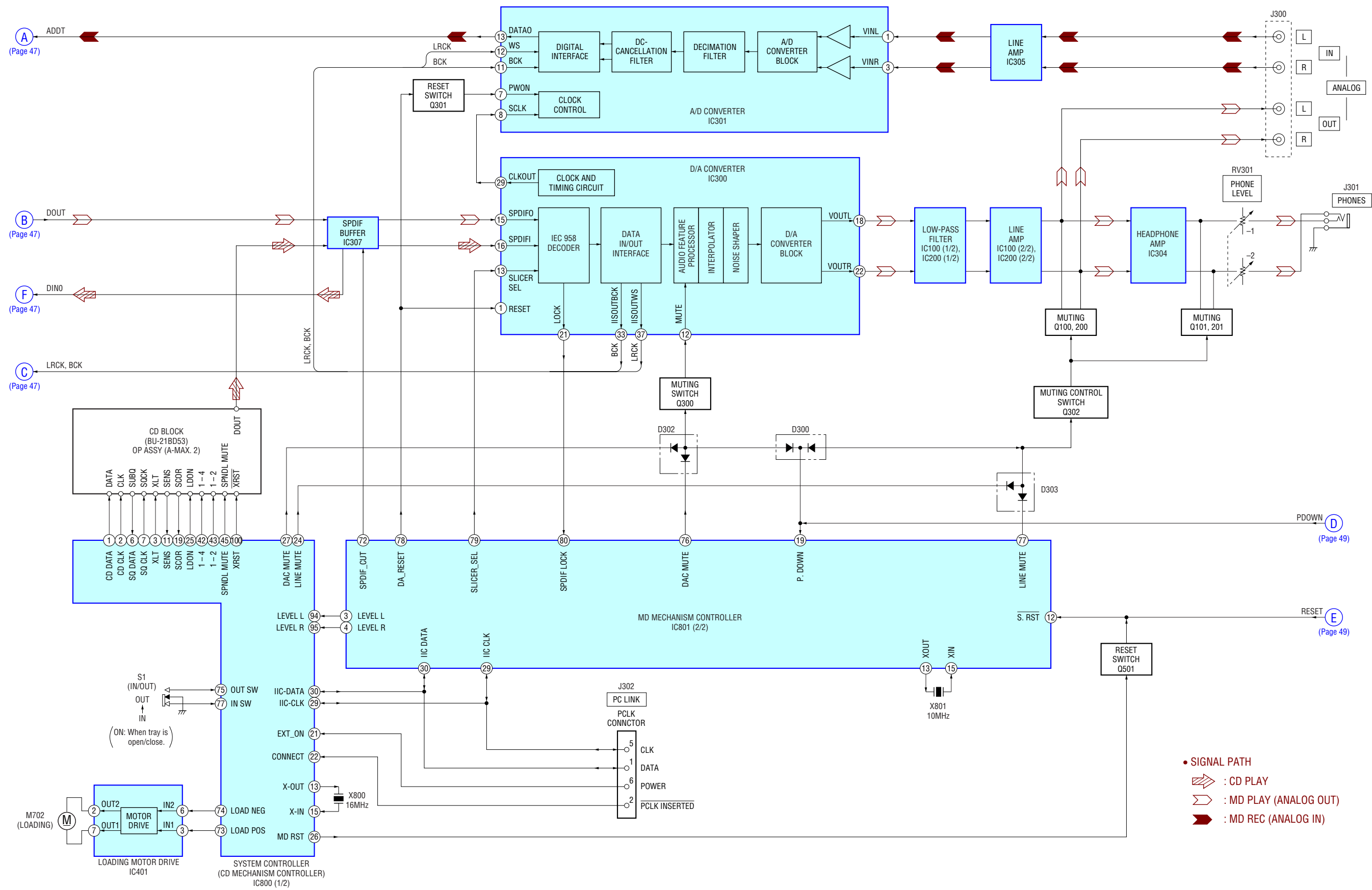
Legend:

- MD PLAY (ANALOG OUT)
- MD REC (ANALOG IN)
- MD REC (DIGITAL IN)
- CD PLAY

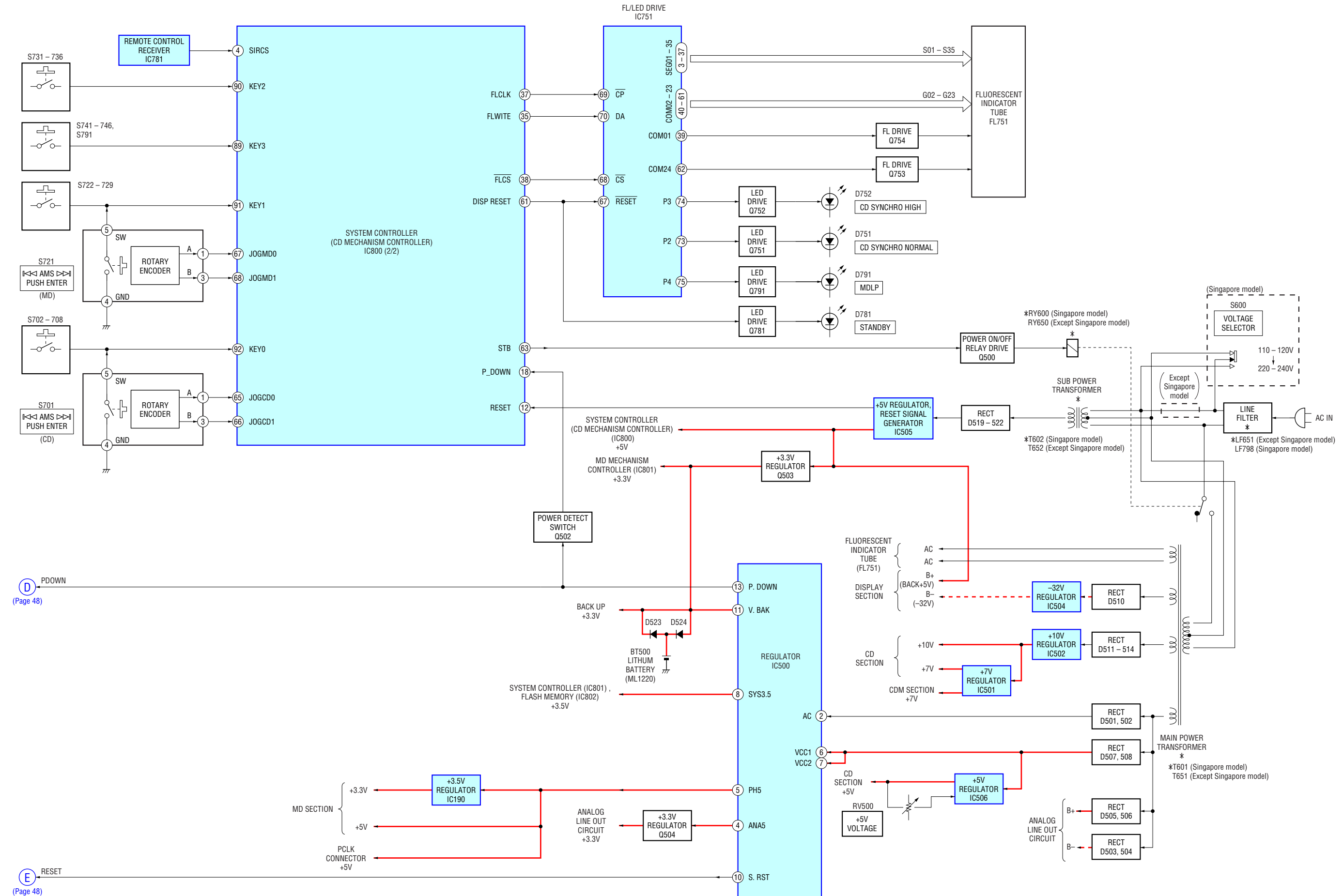
Key Components and Connections:

- Optical Pick-up Block (KMS-262A):** Includes Laser Diode, PD, LD, and DETECTOR.
- Focus/Tracking Coil Drive, Spindle/Sled Motor Drive (IC141):** Controls M101 (SPINDLE) and M102 (SLED).
- RF Amp, Focus/Tracking Error Amp (IC101):** Processes RF signals and error signals.
- Digital Servo Signal Processor (IC151 2/2):** Manages digital servo signals and auto sequencer.
- MD Mechanism Controller (IC801 1/2):** Controls mechanical operations and user inputs (S101, S103, S104, S105, S102-1, S102-2).
- Other Components:** Laser On Switch (Q101), Automatic Power Control (Q121, 122), Wave Shaper (IC302), Optical Receiver (IC303), Digital Optical IN, EEPROM (IC195), and various amplifiers and decoders.

6-2. BLOCK DIAGRAM – MAIN Section –



6-3. BLOCK DIAGRAM – DISPLAY/POWER SUPPLY Section –



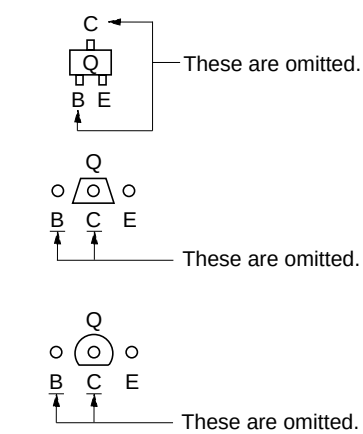
6-4. NOTE FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

Note on Printed Wiring Board:

- — : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Through hole.
- : Pattern from the side which enables seeing.
(The other layers' patterns are not indicated.)

Caution:
Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.
(Side B)
Parts face side: Parts on the parts face side seen from the parts face are indicated.
(Side A)

- Indication of transistor.



Printed wiring board of BD (CD) board is shown only for referring, because CD base unit is replaced as a block.

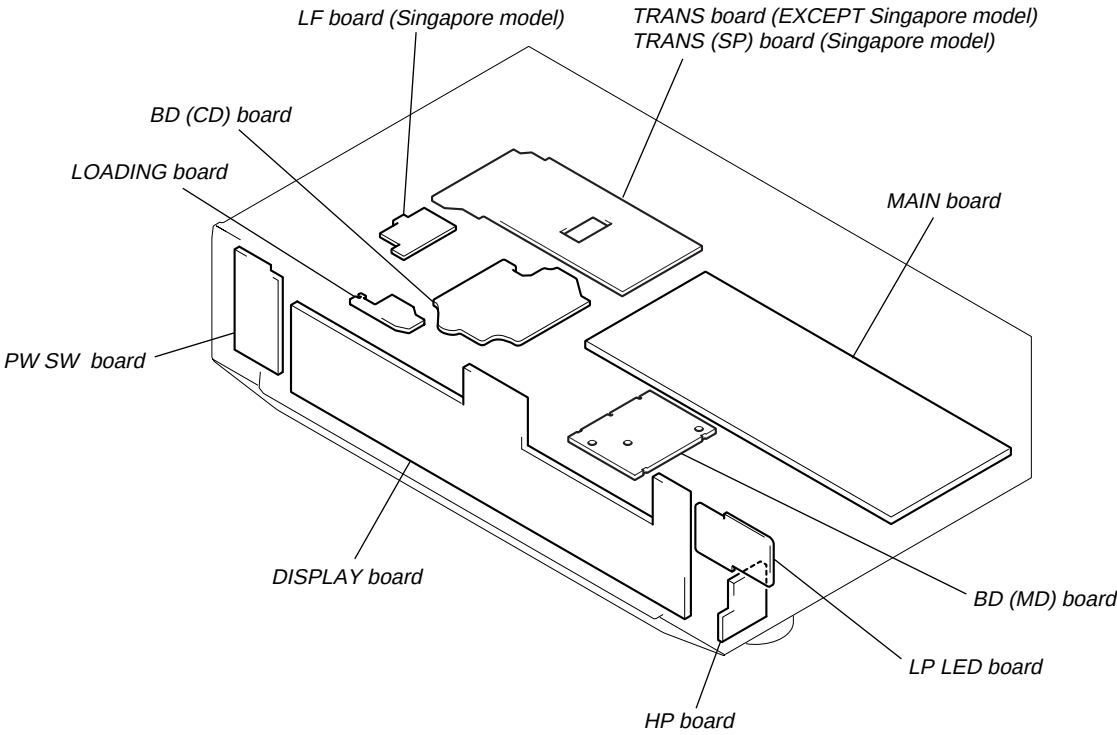
Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$ 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4} \text{ W}$ or less unless otherwise specified.
- Δ : internal component.
- $\text{---} \text{---} \text{---}$: fusible resistor.
- --- : panel designation.

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.	Note: Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
--	---

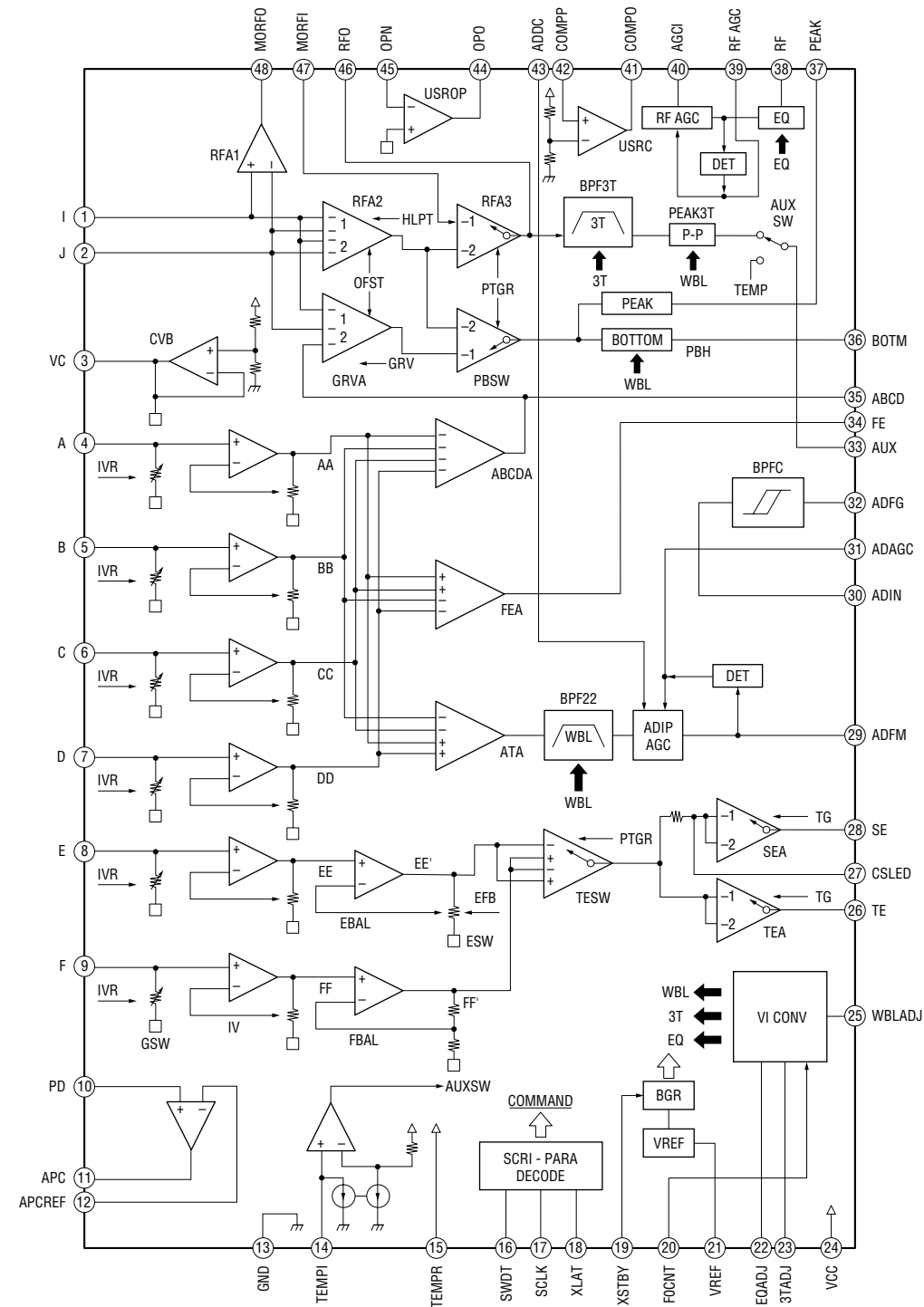
- --- : B+ Line.
- --- : B- Line.
- --- : adjustment for repair.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- --- : MD PLAY (ANALOG OUT)
- --- : MD REC (ANALOG IN)
- --- : MD REC (DIGITAL IN)
- --- : CD PLAY

• Circuit Boards Location

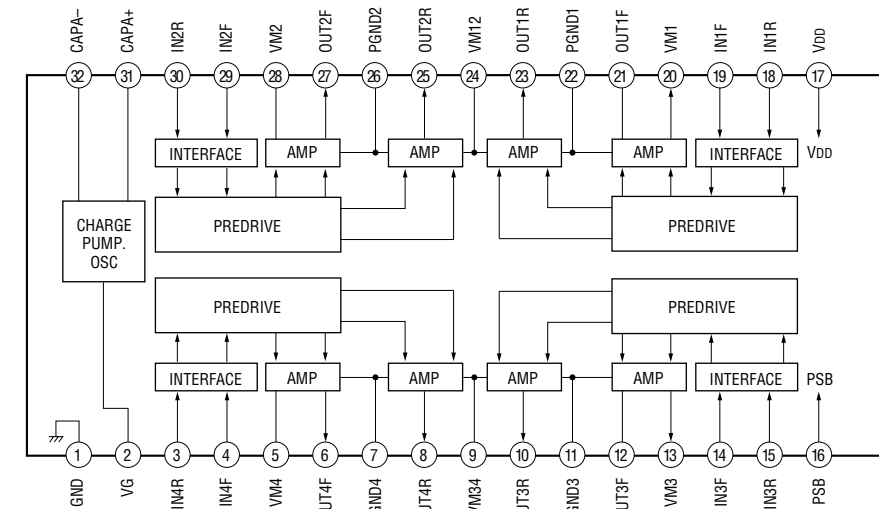


• IC Block Diagrams
– BD (MD) Board –

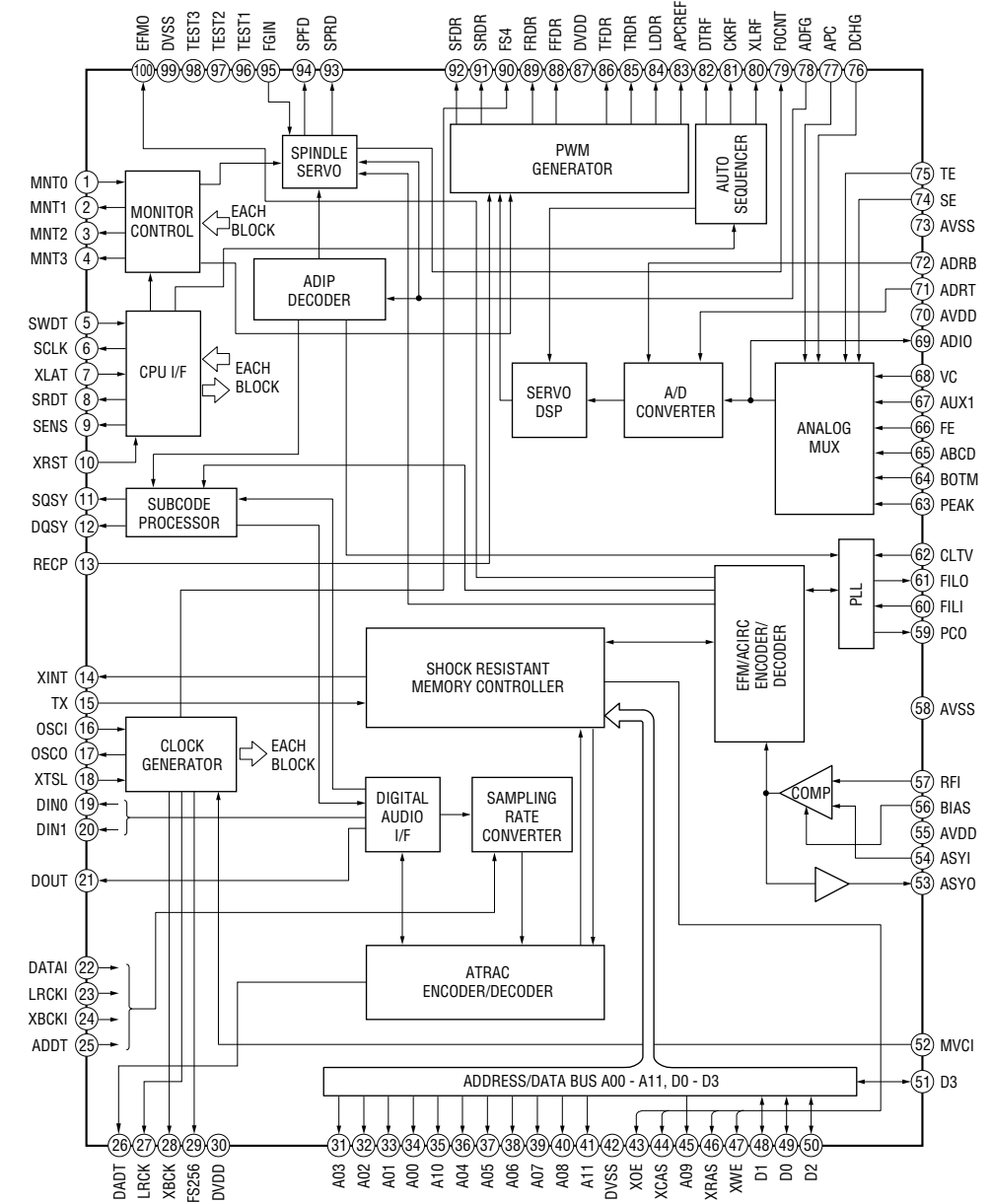
IC101 CXA2523AR



IC141 BH6519FS-E2



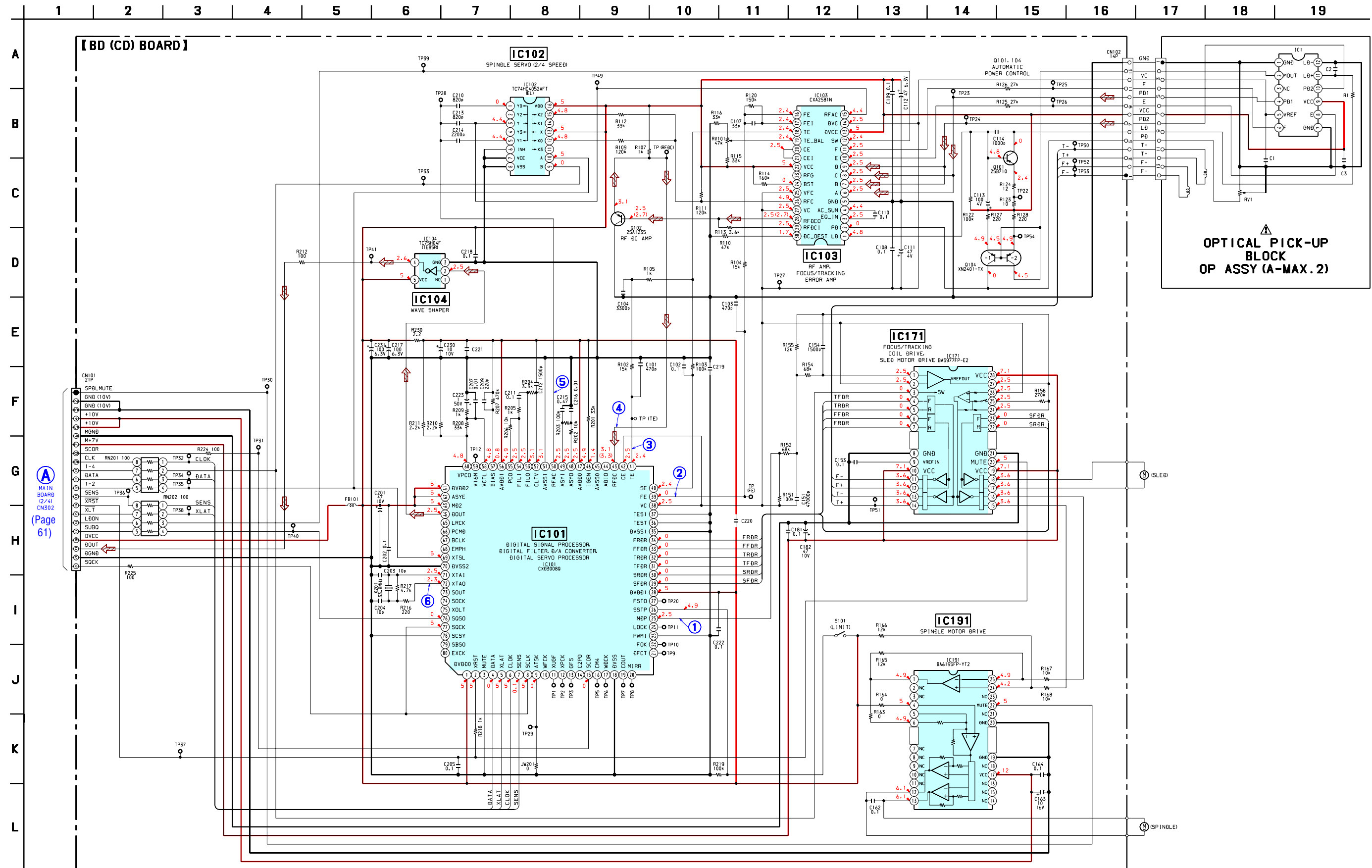
IC151 CXD2662R



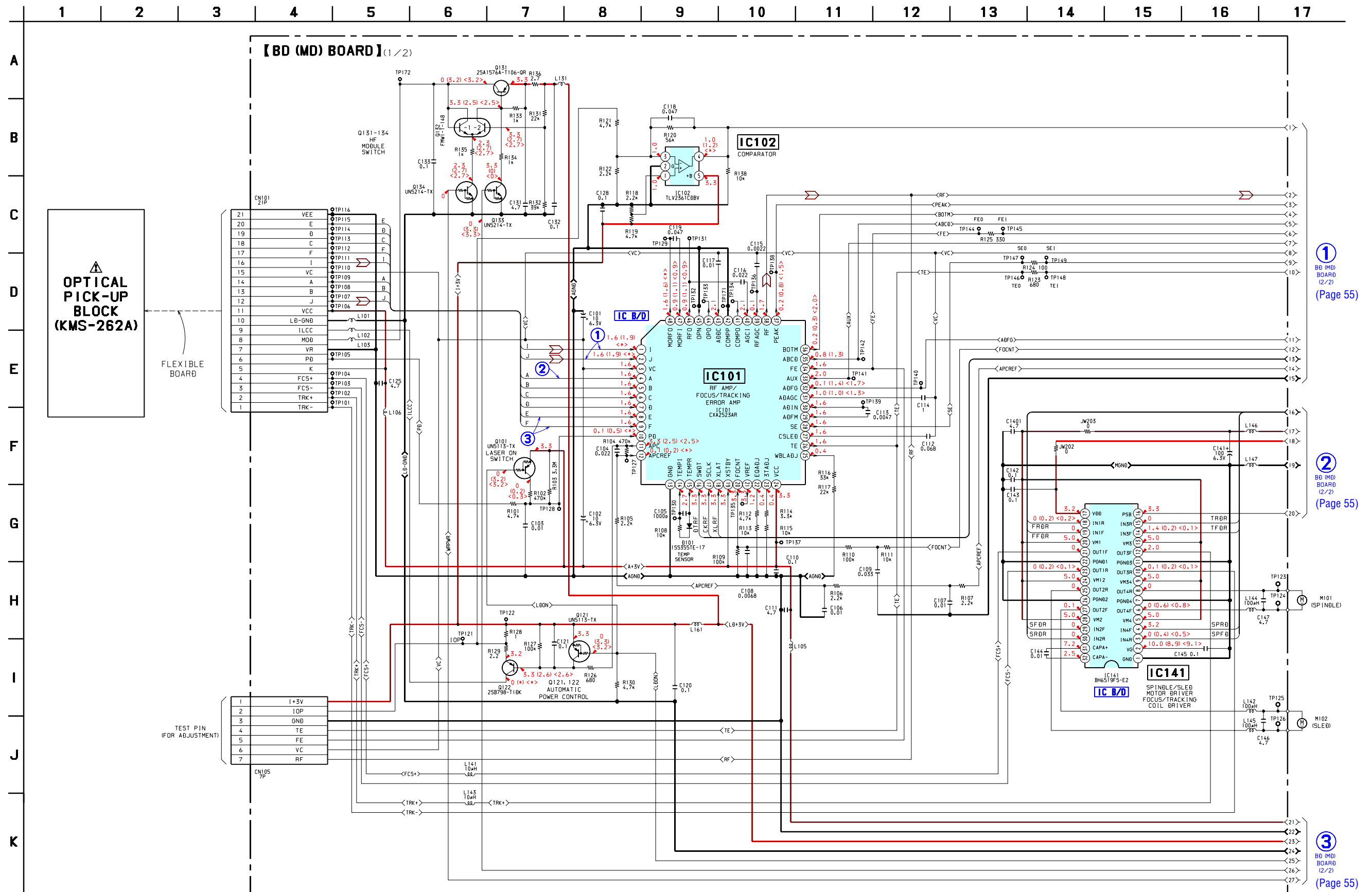


Printed wiring board of BD (CD) board is shown only for referring, because CD base unit is replaced as a block.

6-6. SCHEMATIC DIAGRAM – BD (CD) Board – • See page 57 for Waveforms.



6-7. SCHEMATIC DIAGRAM – BD (MD) Board (1/2) – • See page 57 for Waveforms. • See page 51 for IC Block Diagrams.



Note on Schematic Diagram:

- Voltages and waveforms are dc with respect to ground under no-signal conditions.

no mark : MD STOP

() : MD PLAY

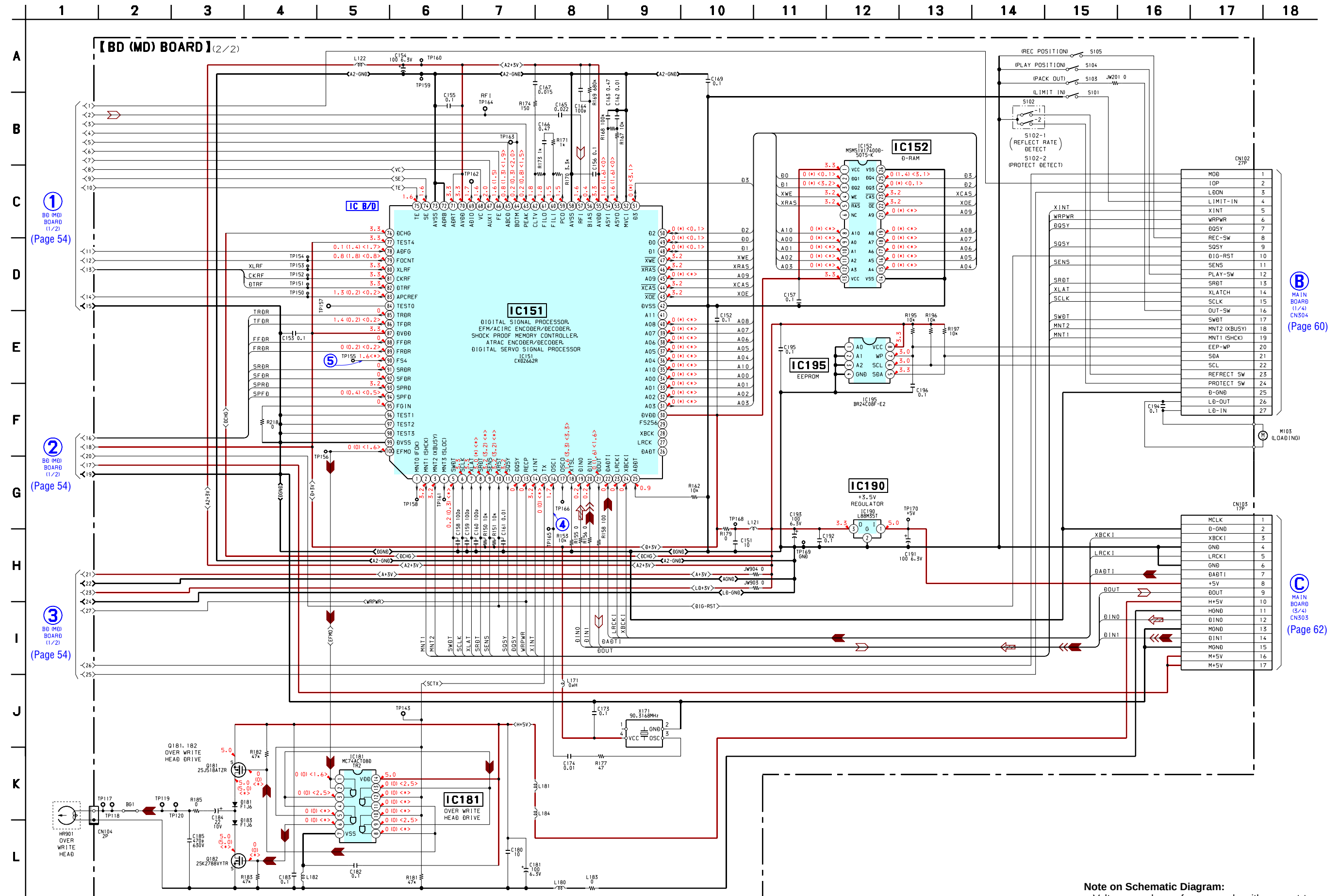
< > : MD REC

* : Impossible to measure

The components identified by mark  or dotted line with mark  are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

6-8. SCHEMATIC DIAGRAM – BD (MD) Board (2/2) – • See page 57 for Waveforms. • See page 51 for IC Block Diagram.



Note on Schematic Diagram:

- Voltages and waveforms are dc with respect to ground under no-signal conditions.

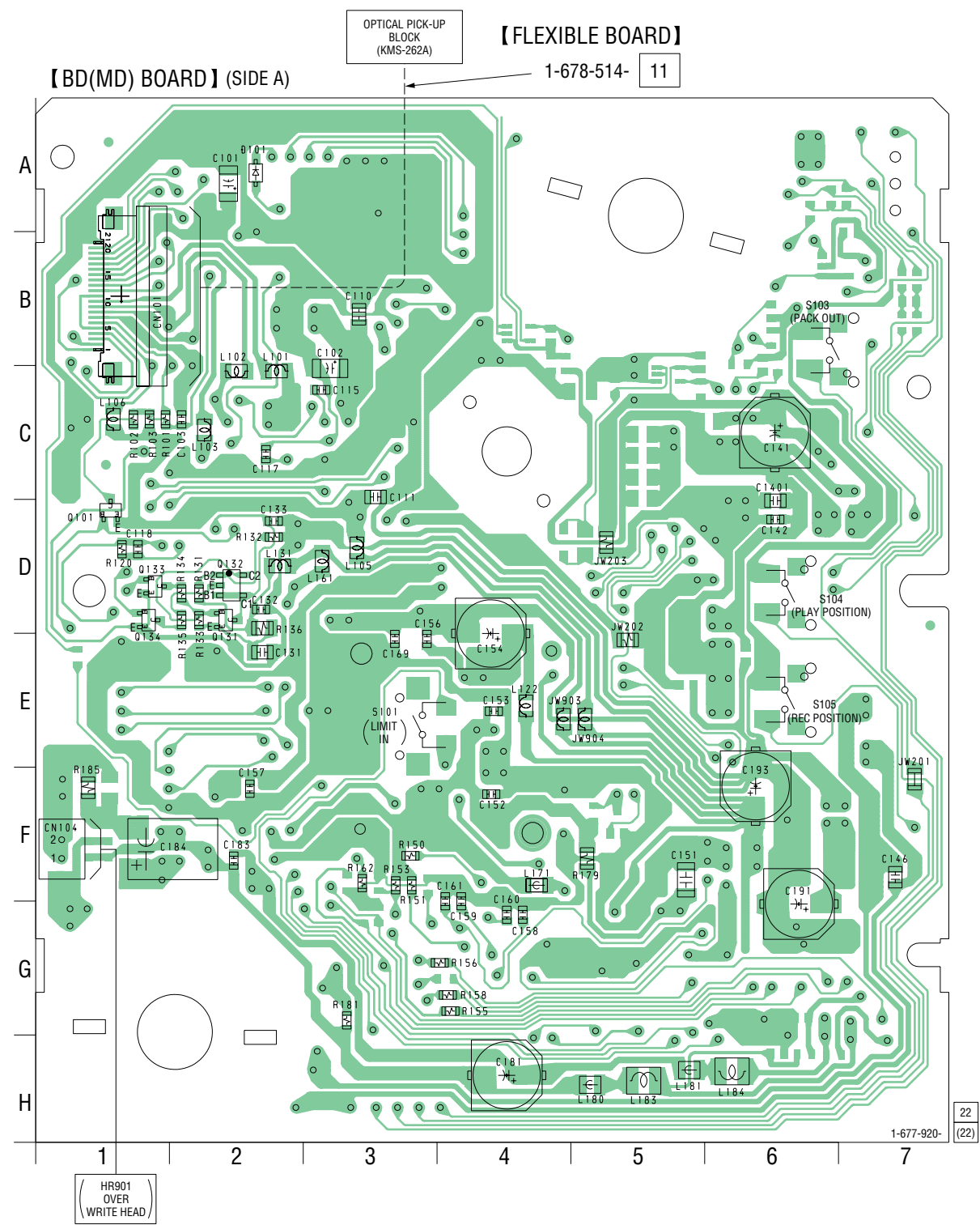
no mark : MD STOP

() : MD PLAY

< > : MD REC

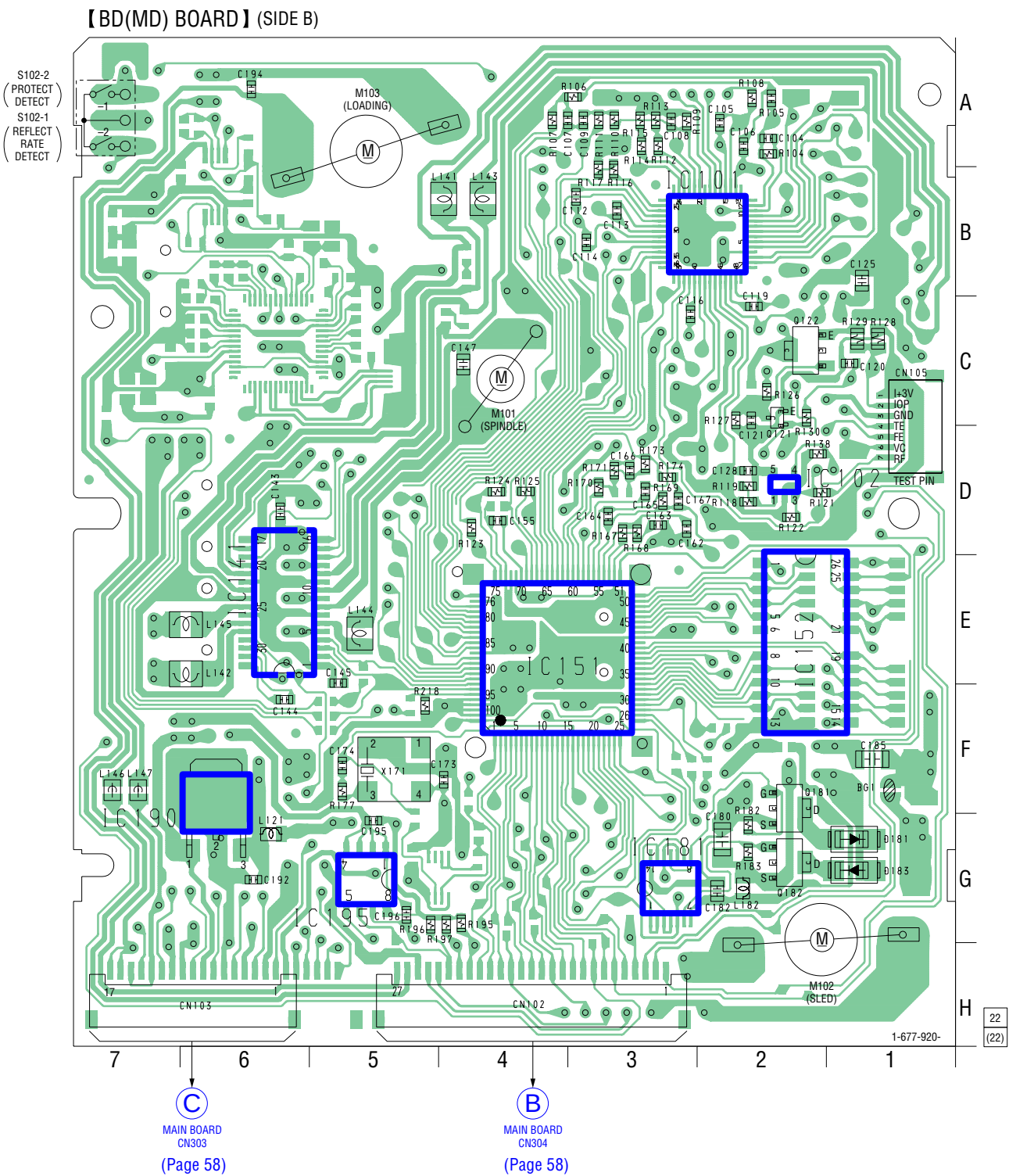
* : Impossible to measure

6-9. PRINTED WIRING BOARD – BD (MD) Board – • See page 50 for Circuit Boards Location.



• Semiconductor Location

Ref. No.	Location
D101	A-2
Q101	D-1
Q131	D-2
Q132	D-2
Q133	D-1
Q134	D-1



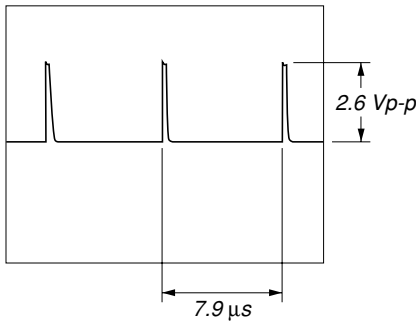
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D181	G-1	IC181	G-3
D183	G-1	IC190	G-6
IC101	B-2	IC195	G-5
IC102	D-2	Q121	C-2
IC141	E-6	Q122	C-2
IC151	E-4	Q181	F-2
IC152	E-2	Q182	G-2

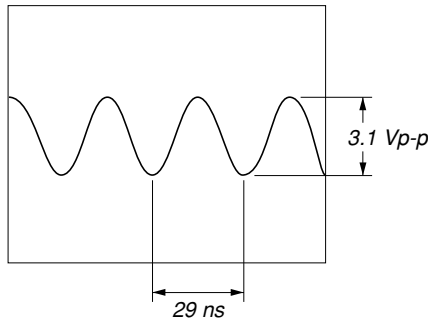
There are a few cases that the part isn't mounted in model is printed on diagrams.

• Waveforms
– BD (CD) Board –

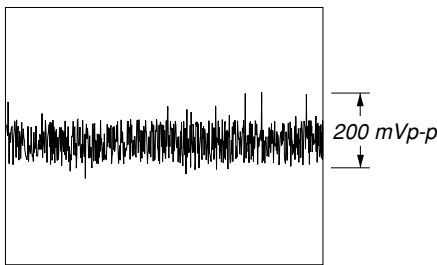
① IC101 ②⑤ (MDP) (CD PLAY mode)



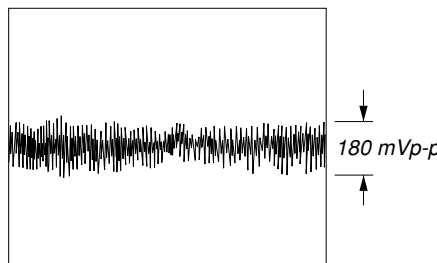
⑥ IC101 ⑦② (XTAO)



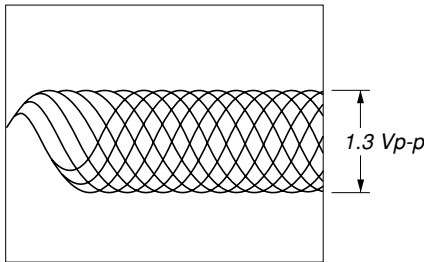
② IC101 ③⑨ (FE) (CD PLAY mode)



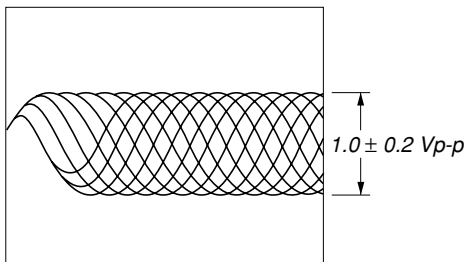
③ IC101 ④① (TE) (CD PLAY mode)



④ IC101 ④③ (RFDC) (CD PLAY mode)

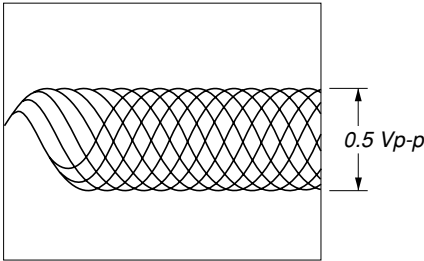


⑤ IC101 ⑤⑥ (RFAC) (CD PLAY mode)

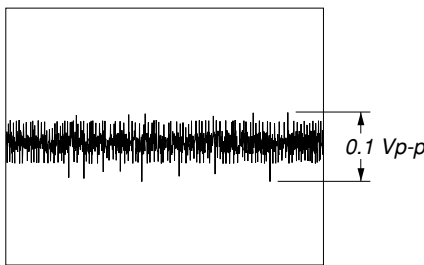


– BD (MD) Board –

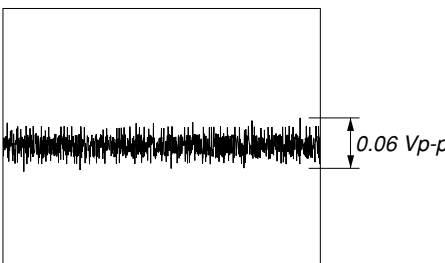
① IC101 ① (I), ② (J) (MD PLAY mode)



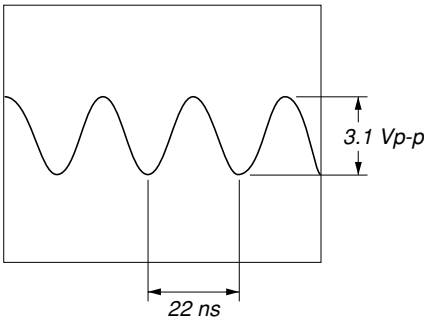
② IC101 ④ (A) (MD PLAY mode)



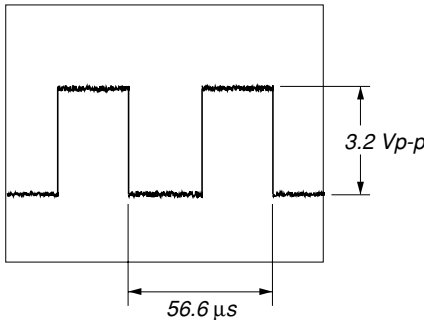
③ IC101 ⑧ (E), ⑨ (F) (MD PLAY mode)



④ IC151 ①⑥ (OSCI)

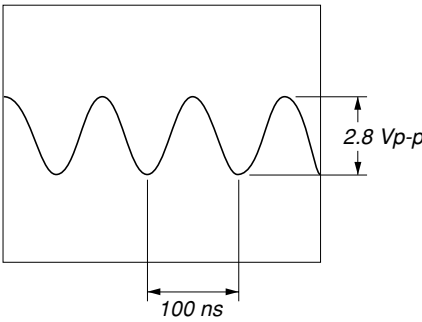


⑤ IC151 ⑨⑩ (FS4)

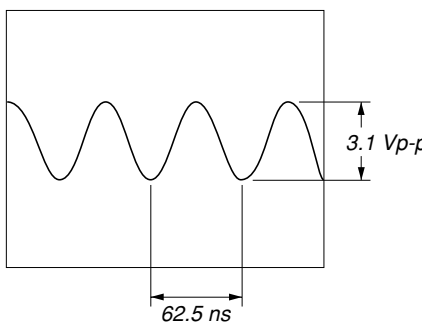


– MAIN Board –

① IC801 ①③ (XOUT)

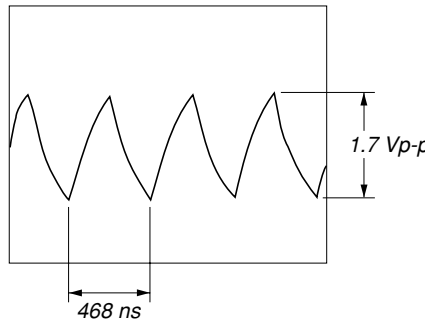


② IC800 ①③ (X-OUT)

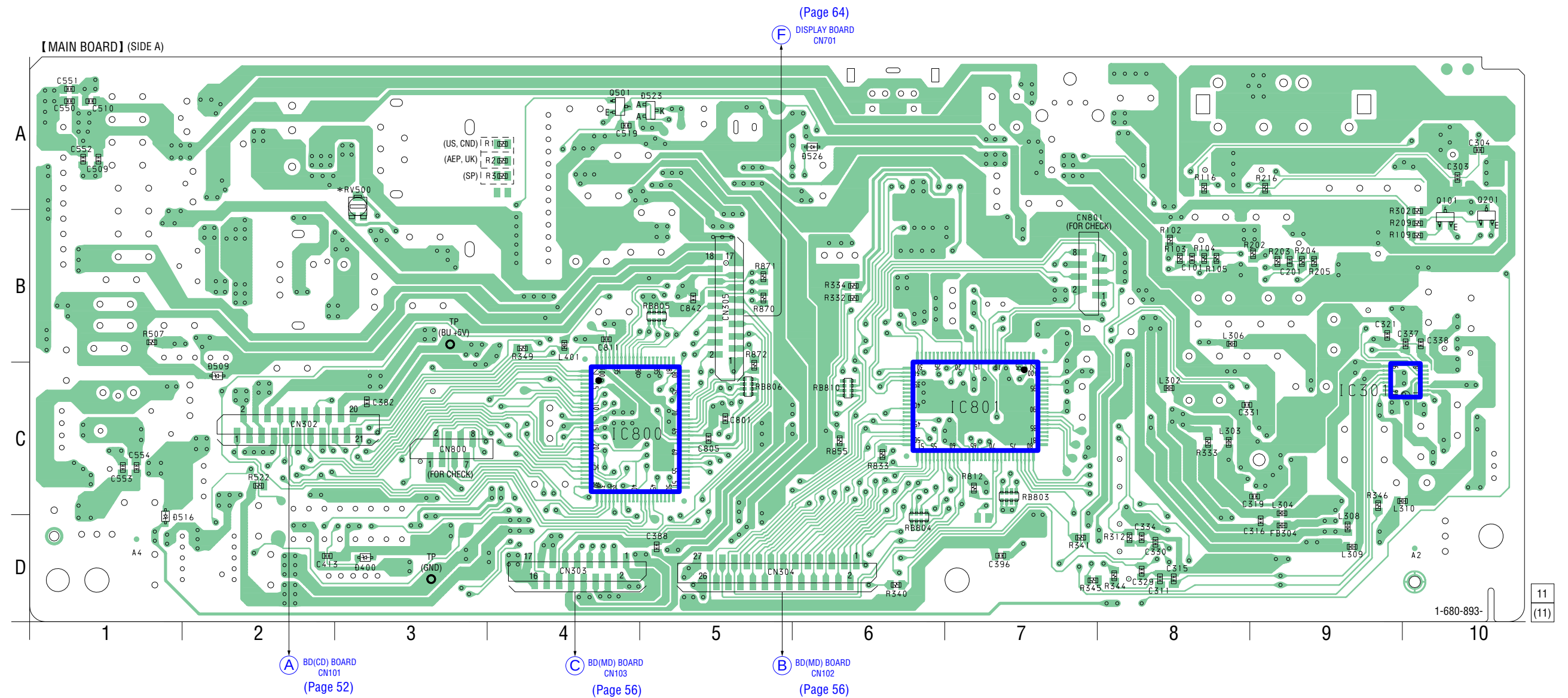


– DISPLAY Board –

① IC751 ⑥⑤ (OSCI)



6-10. PRINTED WIRING BOARD – MAIN Board (Side A) – • See page 50 for Circuit Boards Location.



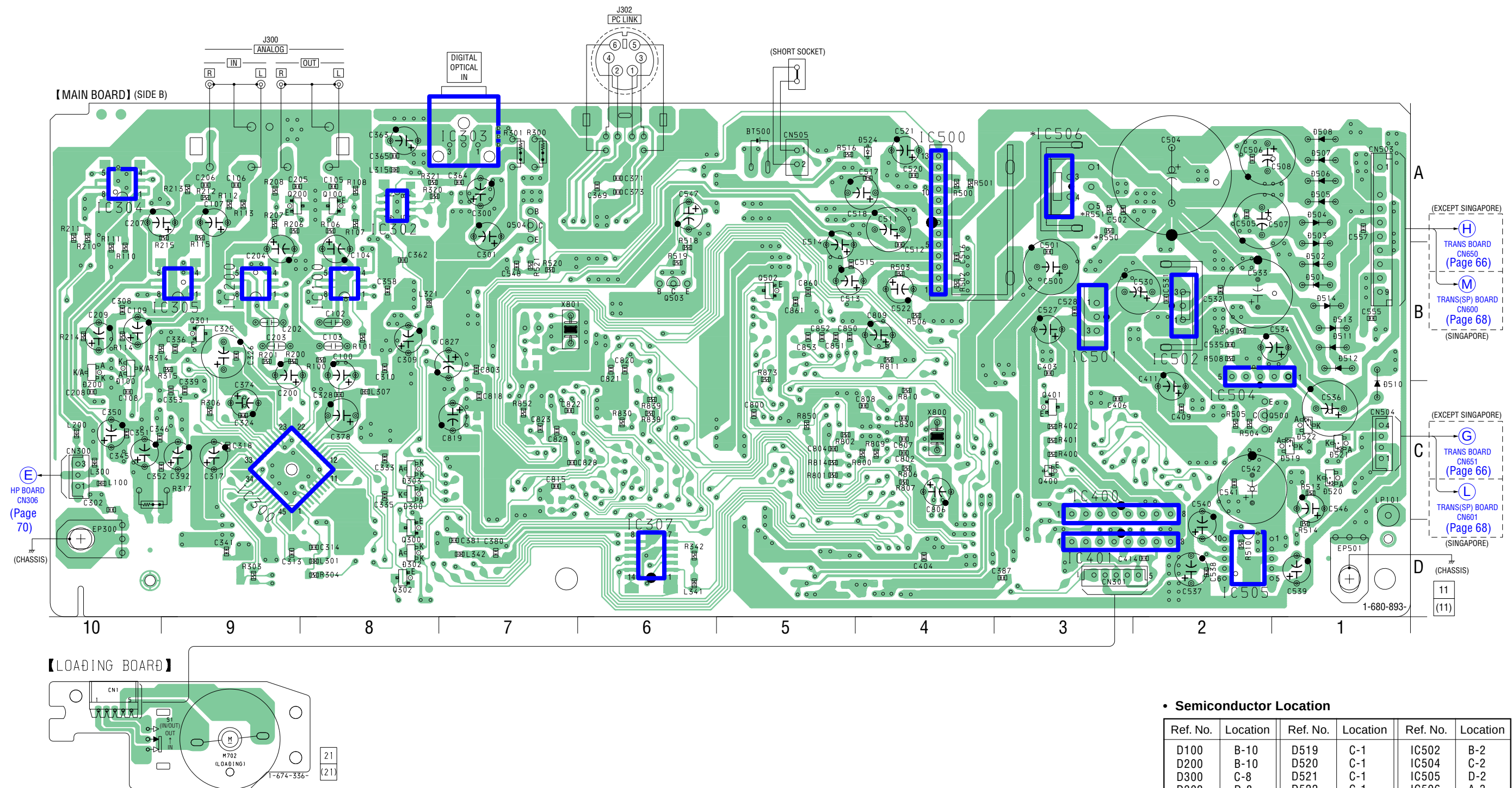
- **Semiconductor Location**

Ref. No.	Location
D400	D-3
D509	C-2
D516	D-1
D523	A-5
D526	A-6
IC301	C-9
IC800	C-4
IC801	C-7
Q101	B-10
Q201	B-10
Q501	A-4

Note: Be sure to execute the Voltage Adjustment on page 46, whenever the asterisked parts (IC506, R550, R551, RV500), mounted MAIN board, and CD base unit (BU-21BD53) were replaced.

There are a few cases that the part isn't mounted in model is printed on diagrams.

6-11. PRINTED WIRING BOARDS – MAIN (Side B)/LOADING Boards – • See page 50 for Circuit Boards Location.



• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D100	B-10	D519	C-1	IC502	B-2
D200	B-10	D520	C-1	IC504	C-2
D300	C-8	D521	C-1	IC505	D-2
D302	D-8	D522	C-1	IC506	A-3
D303	C-8	D524	A-4		
D501	B-1			Q100	A-8
D502	B-1	IC100	B-8	Q200	A-9
D503	B-1	IC200	B-9	Q300	D-8
D504	A-1	IC300	C-9	Q301	B-9
D505	A-1	IC302	A-8	Q302	D-8
D506	A-1	IC303	A-7	Q400	C-3
D507	A-1	IC304	A-10	Q401	C-3
D508	A-1	IC305	B-9	Q500	C-2
D510	C-1	IC307	D-6	Q502	B-5
D511	B-1	IC400	C-3	Q503	B-6
D512	B-1	IC401	D-3	Q504	A-7
D513	B-1	IC500	A-4		
D514	B-1	IC501	B-3		



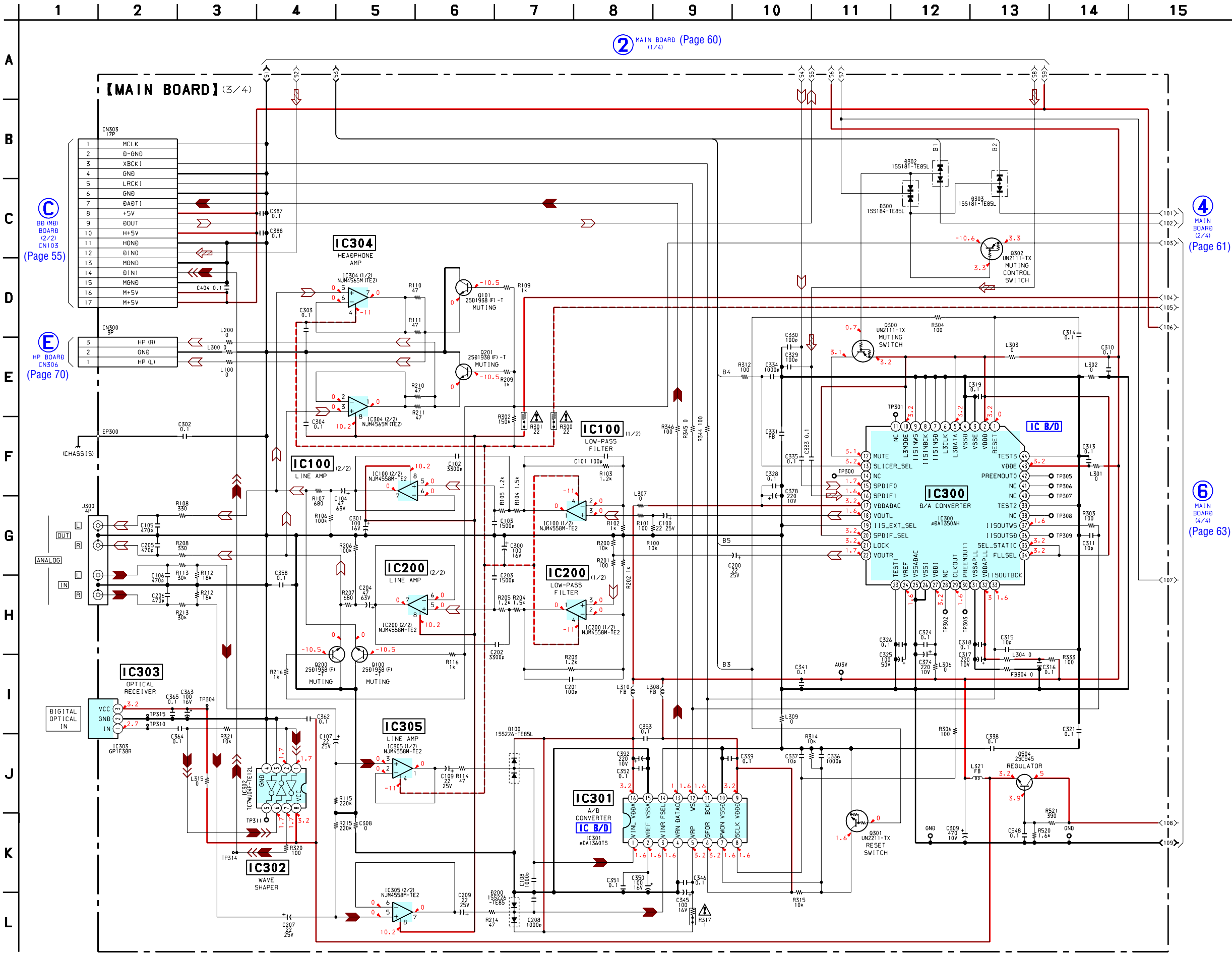
- Voltages and waveforms are dc with respect to ground under no-signal conditions.

no mark : MD, CD STOP
() : MD PLAY

60 60



6-14. SCHEMATIC DIAGRAM – MAIN Board (3/4) – • See page 70 for IC Block Diagrams.

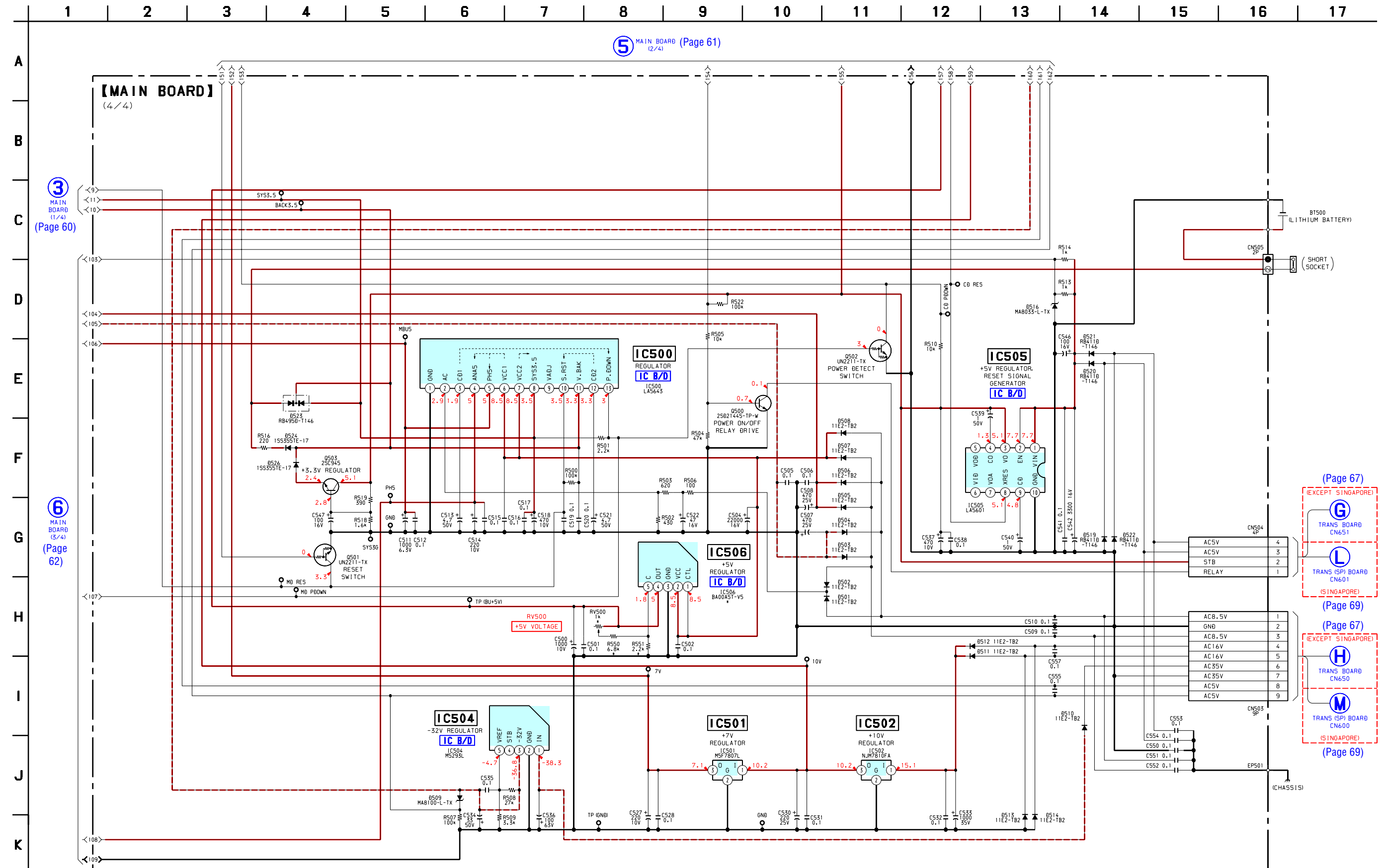


Note on Schematic Diagram:
• Voltages and waveforms are dc with respect to ground under no-signal conditions.
no mark : MD, CD STOP

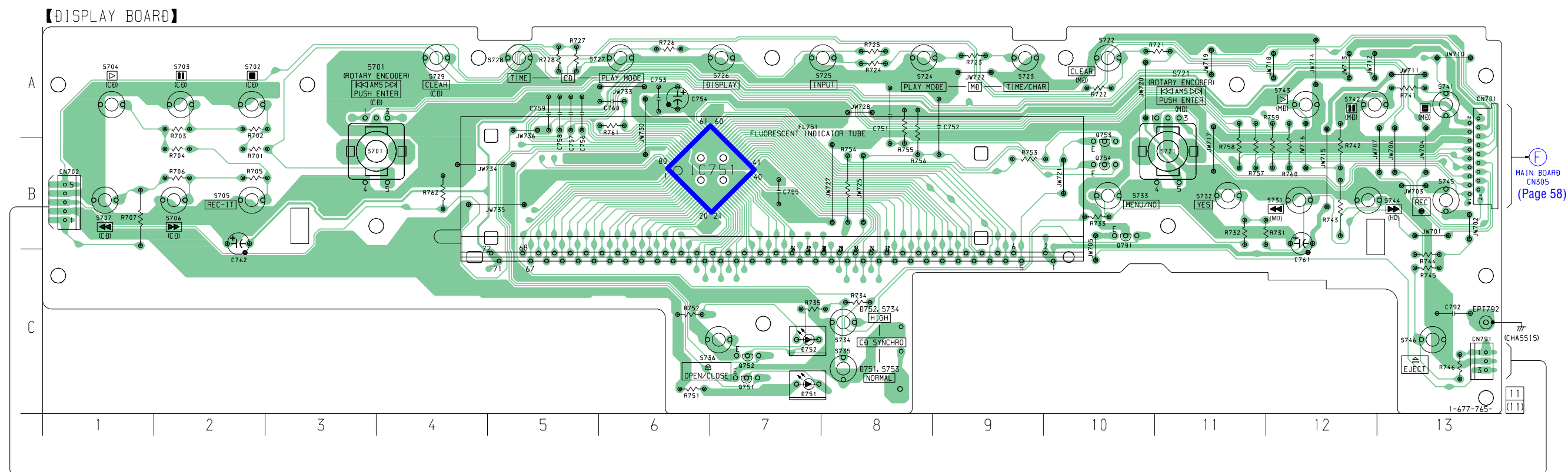
The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

6-15. SCHEMATIC DIAGRAM – MAIN Board (4/4) – • See page 70 for IC Block Diagrams.

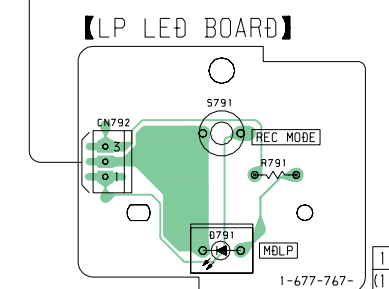
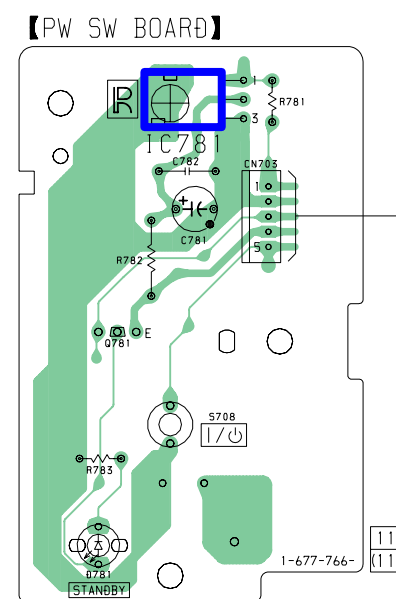


6-16. PRINTED WIRING BOARDS – DISPLAY/LP LED/PW SW Boards – • See page 50 for Circuit Boards Location.



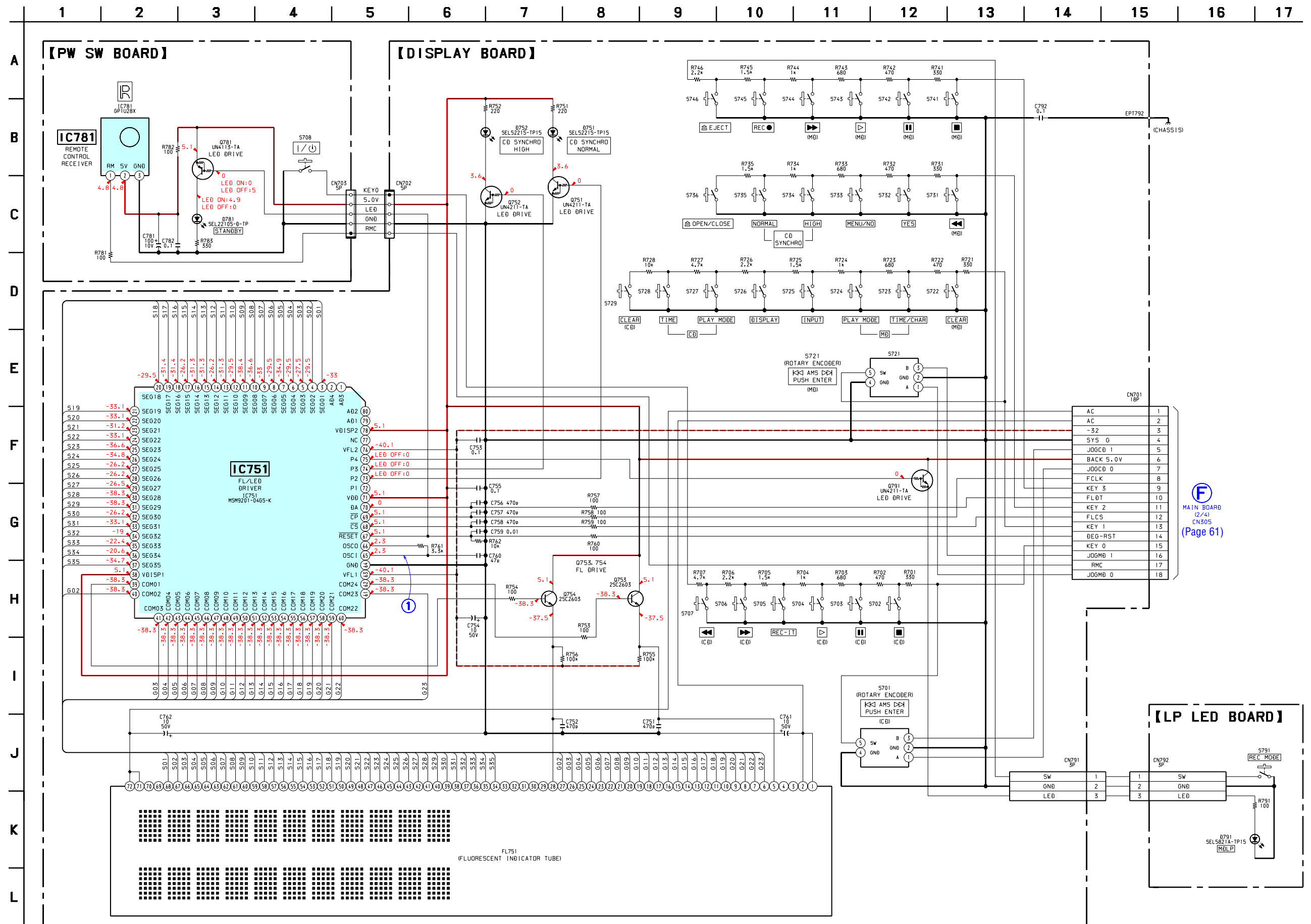
- **Semiconductor Location**

Ref. No.	Location
D751	C-7
D752	C-7
IC751	B-7
Q751	C-7
Q752	C-7
Q753	B-10
Q754	B-10
Q791	B-10



There are a few cases that the part isn't mounted in model is printed on diagrams.

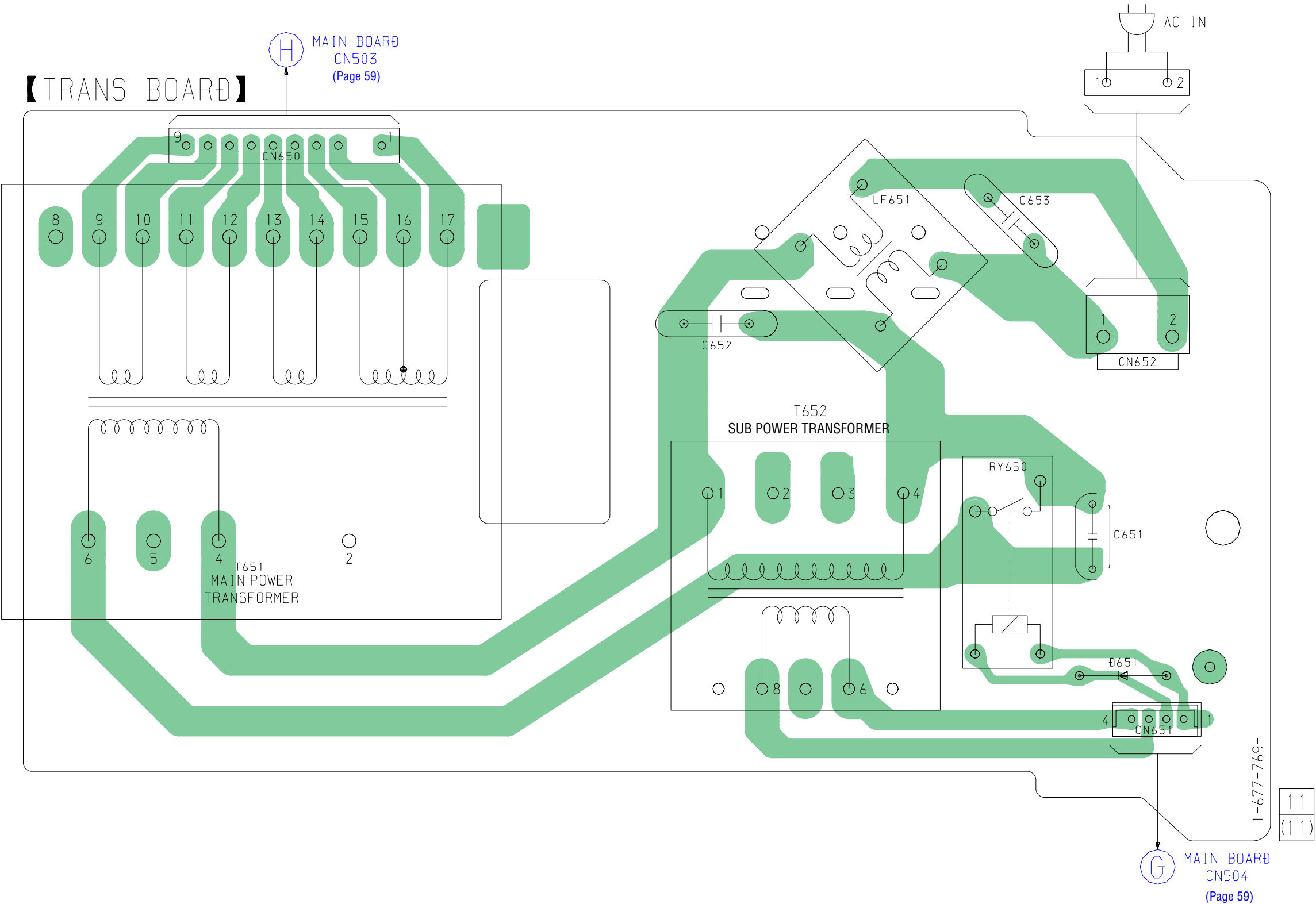
6-17. SCHEMATIC DIAGRAM – DISPLAY/LP LED/PW SW Boards – • See page 57 for Waveform.



Note on Schematic Diagram:

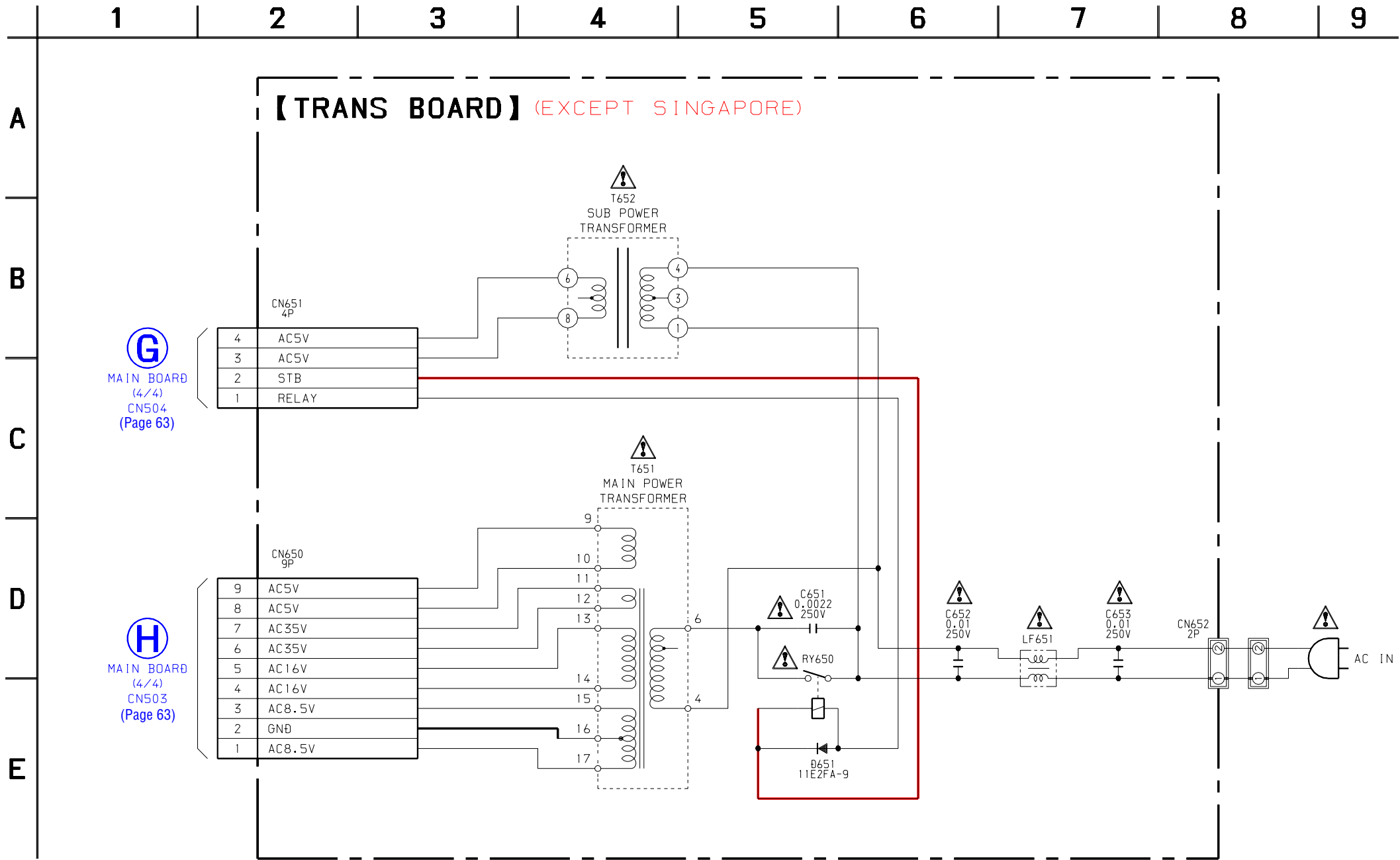
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- no mark : MD, CD STOP

6-18. PRINTED WIRING BOARD – TRANS Board (Except Singapore) – • See page 50 for Circuit Boards Location.



There are a few cases that the part isn't mounted in model is printed on diagrams.

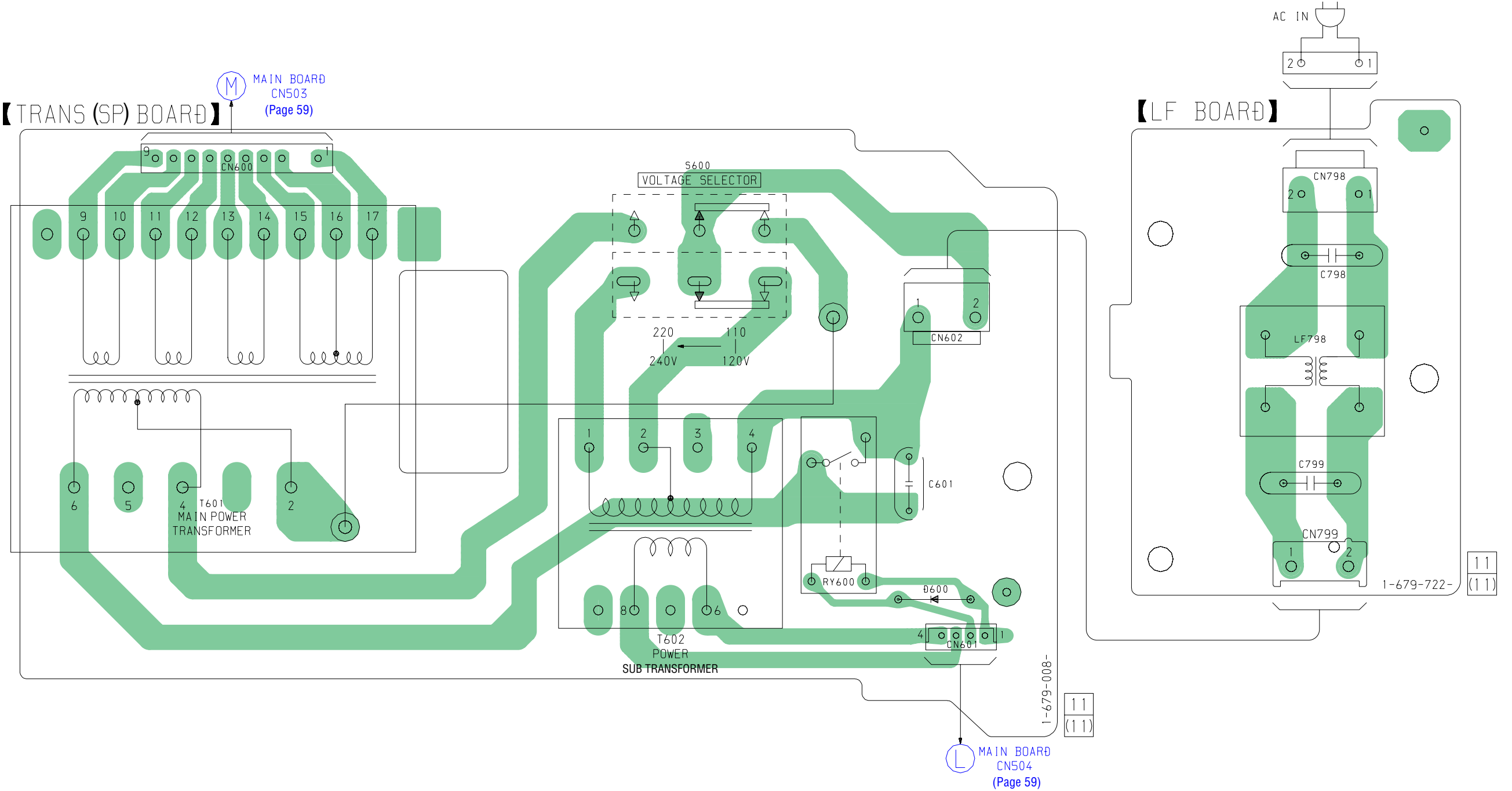
6-19. SCHEMATIC DIAGRAM – TRANS Board (Except Singapore) –



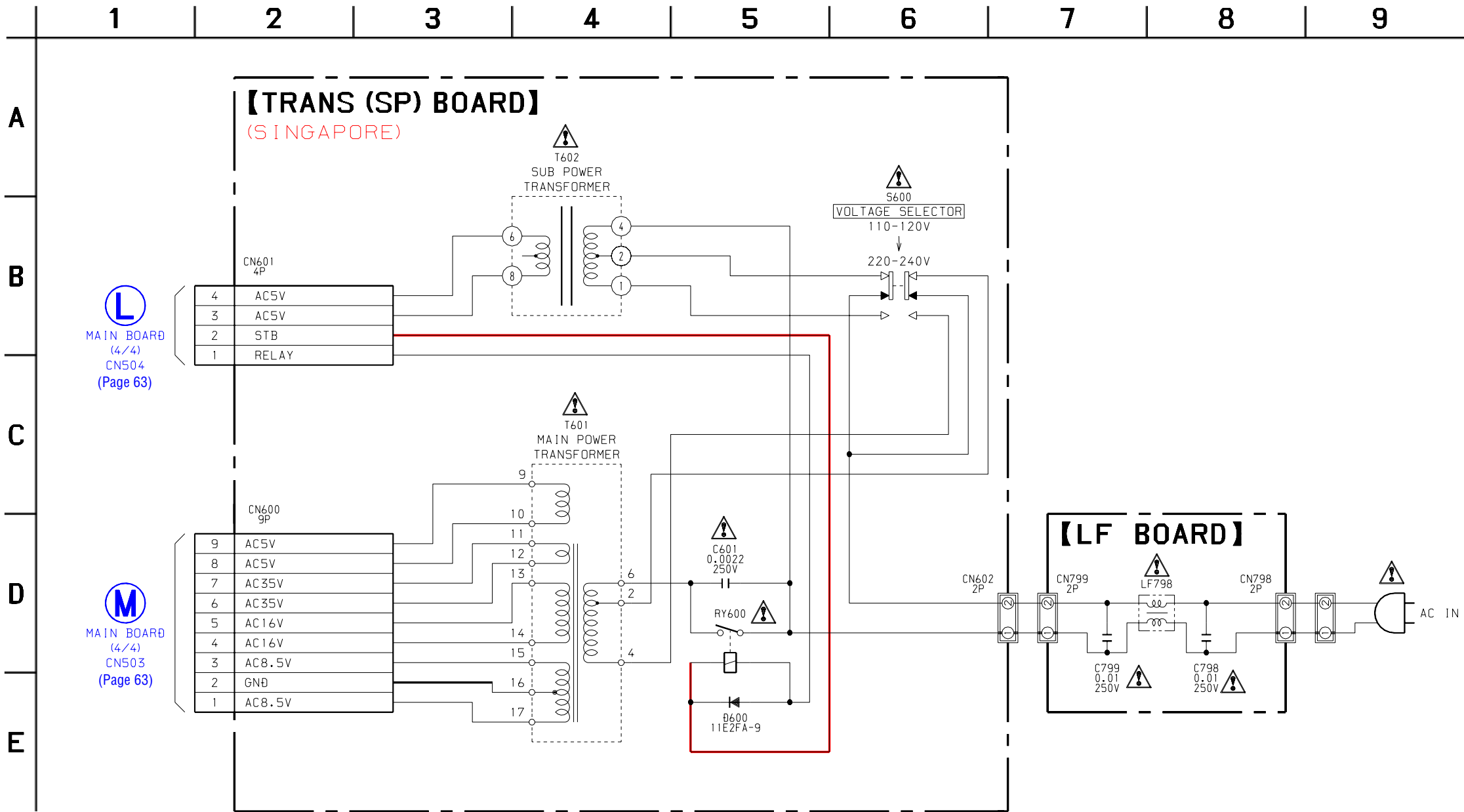
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

6-20. PRINTED WIRING BOARDS – TRANS (SP)/LF Boards (Singapore) – • See page 50 for Circuit Boards Location.



6-21. SCHEMATIC DIAGRAM – TRANS (SP)/LF Boards (Singapore) –

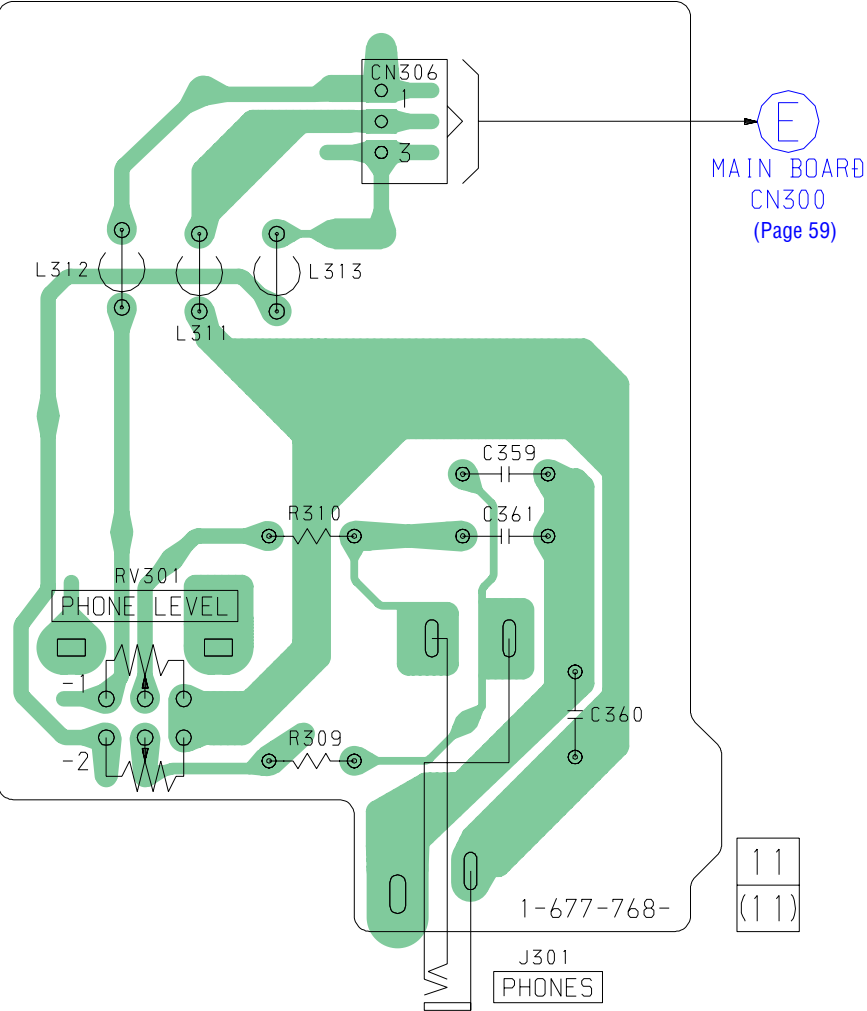


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

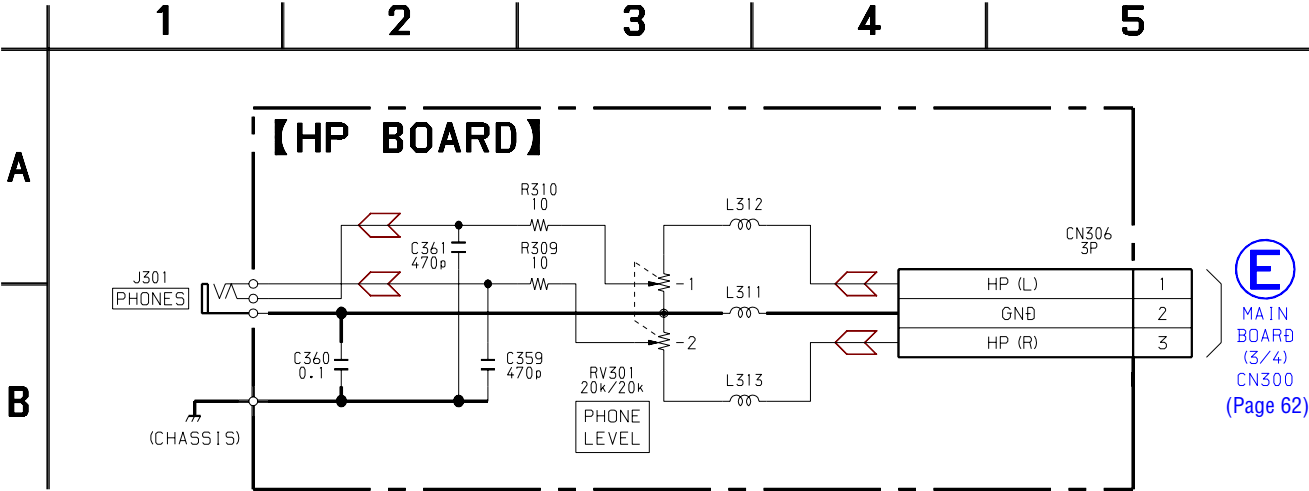
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

6-22. PRINTED WIRING BOARD – HP Board – • See page 50 for Circuit Boards Location.

【HP BOARD】

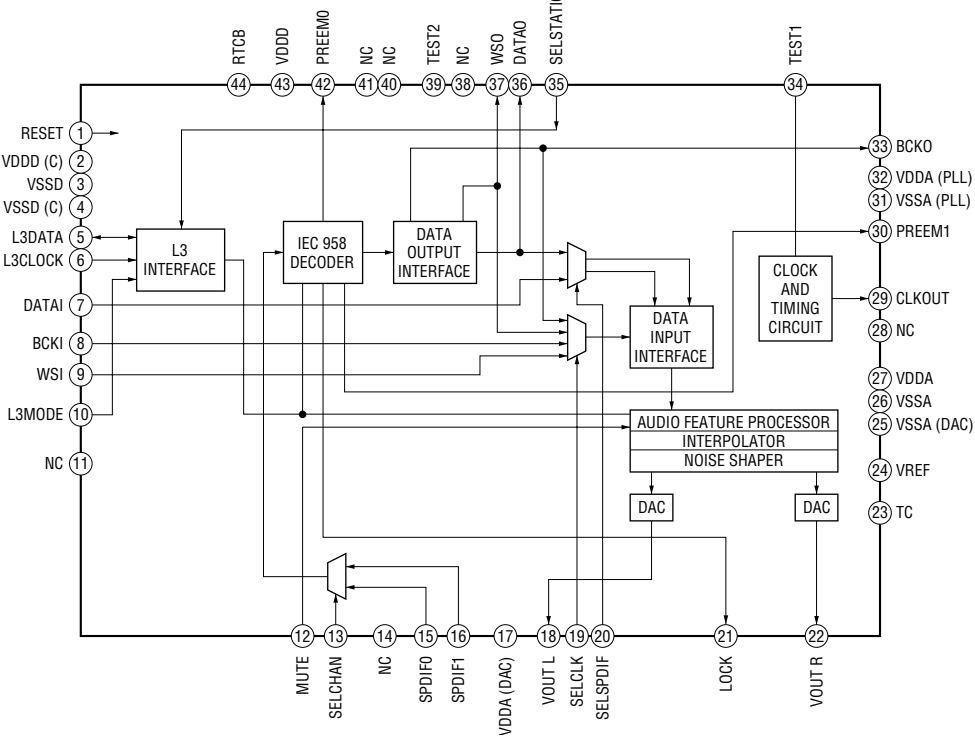


6-23. SCHEMATIC DIAGRAM – HP Board –

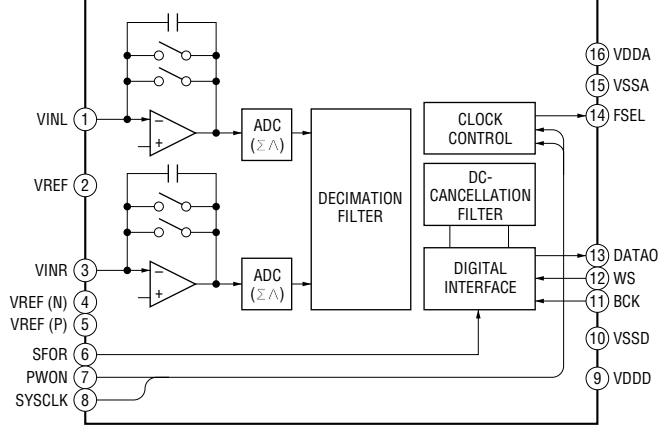


• IC Block Diagrams
– MAIN Board –

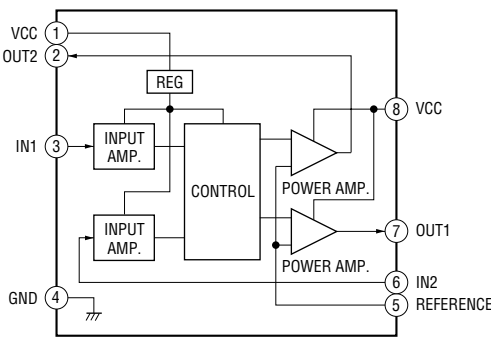
IC300 μ DA1350AH



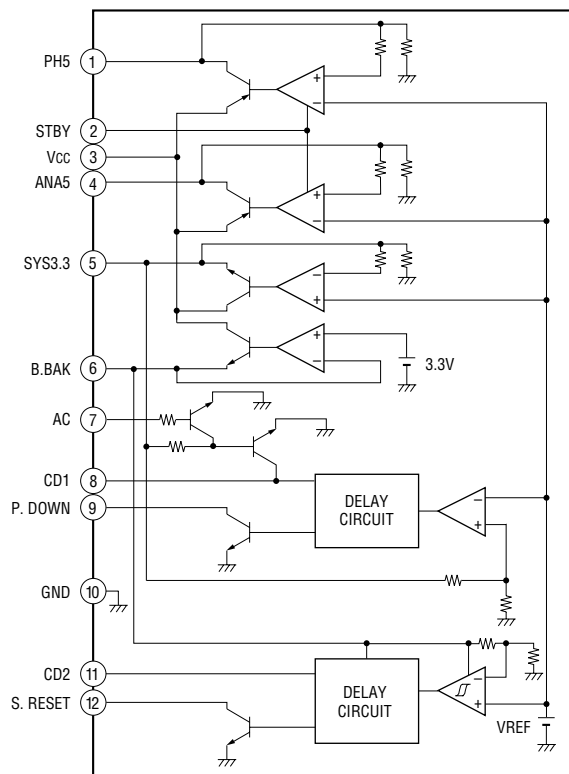
IC301 μ DA1360TS



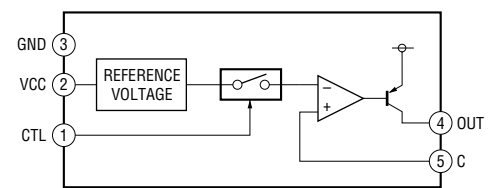
IC400, 401 M54641L



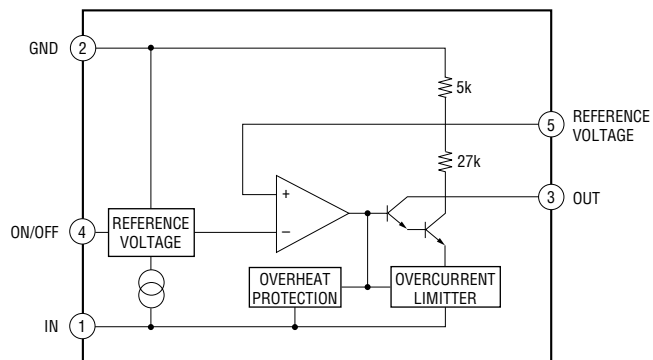
IC500 LA5643



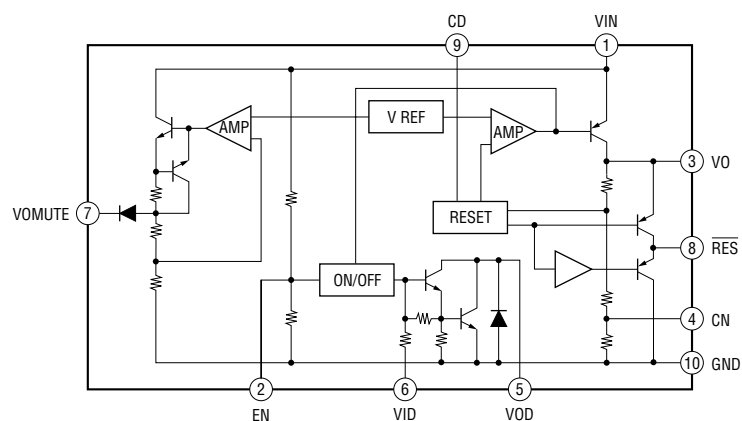
IC506 BA00AST-V5



IC504 M5293L



IC505 LA5601



6-24. IC PIN FUNCTION DESCRIPTION

• BD (MD) BOARD IC101 CXA2523AR (RF AMP, FOCUS/TRACKING ERROR AMP)

Pin No.	Pin Name	I/O	Description
1	I	I	I-V converted RF signal I input from the optical pick-up block detector
2	J	I	I-V converted RF signal J input from the optical pick-up block detector
3	VC	O	Middle point voltage (+1.65V) generation output terminal
4 to 9	A to F	I	Signal input from the optical pick-up detector
10	PD	I	Light amount monitor input from the optical pick-up block laser diode
11	APC	O	Laser amplifier output terminal to the automatic power control circuit
12	APCREF	I	Reference voltage input for setting laser power from the CXD2662R (IC151)
13	GND	—	Ground terminal
14	TEMPI	I	Connected to the temperature sensor
15	TEMPR	O	Output terminal for a temperature sensor reference voltage
16	SWDT	I	Writing serial data input from the CXD2662R (IC151)
17	SCLK	I	Serial data transfer clock signal input from the CXD2662R (IC151)
18	XLAT	I	Serial data latch pulse signal input from the CXD2662R (IC151)
19	$\overline{\text{XSTBY}}$	I	Standby signal input terminal “L”: standby (fixed at “H” in this set)
20	F0CNT	I	Center frequency control voltage input terminal of internal circuit (BPF22, BPF3T, EQ) input from the CXD2662R (IC151)
21	VREF	O	Reference voltage output terminal Not used (open)
22	EQADJ	I	Center frequency setting terminal for the internal circuit (EQ)
23	3TADJ	I	Center frequency setting terminal for the internal circuit (BPF3T)
24	VCC	—	Power supply terminal (+3.5V)
25	WBLADJ	I	Center frequency setting terminal for the internal circuit (BPF22)
26	TE	O	Tracking error signal output to the CXD2662R (IC151)
27	CSLED	I	Connected to the external capacitor for low-pass filter of the sled error signal
28	SE	O	Sled error signal output to the CXD2662R (IC151)
29	ADFM	O	FM signal output of the ADIP
30	ADIN	I	Receives a ADIP FM signal in AC coupling
31	ADAGC	I	Connected to the external capacitor for ADIP AGC
32	ADFG	O	ADIP duplex signal (22.05 kHz $\pm$ 1 kHz) output to the CXD2662R (IC151)
33	AUX	O	Auxiliary signal (I ₃ signal/temperature signal) output to the CXD2662R (IC151)
34	FE	O	Focus error signal output to the CXD2662R (IC151)
35	ABCD	O	Light amount signal (ABCD) output to the CXD2662R (IC151)
36	BOTM	O	Light amount signal (RF/ABCD) bottom hold output to the CXD2662R (IC151)
37	PEAK	O	Light amount signal (RF/ABCD) peak hold output to the CXD2662R (IC151)
38	RF	O	Playback EFM RF signal output to the CXD2662R (IC151)
39	RFAGC	I	Connected to the external capacitor for RF auto gain control circuit
40	AGCI	I	Receives a RF signal in AC coupling
41	COMPO	O	User comparator output terminal Not used (open)
42	COMPP	I	User comparator input terminal Not used (fixed at “L”)
43	ADDC	I	Connected to the external capacitor for cutting the low band of the ADIP amplifier
44	OPO	O	User operational amplifier output terminal Not used (open)
45	OPN	I	User operational amplifier inversion input terminal Not used (fixed at “L”)
46	RFO	O	RF signal output terminal
47	MORFI	I	Receives a MO RF signal in AC coupling
48	MORFO	O	MO RF signal output terminal

• **BD (MD) BOARD IC151 CXD2662R**
(DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO PROCESSOR, EFM/ACIRC ENCODER/DECODER, SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER)

Pin No.	Pin Name	I/O	Description
1	MNT0 (FOK)	O	Focus OK signal output terminal “H” is output when focus is on (“L”: NG) Not used (open)
2	MNT1 (SHOCK)	O	Track jump detection signal output to the system controller (IC801)
3	MNT2 (XBUSY)	O	Busy monitor signal output to the system controller (IC801)
4	MNT3 (SLOCK)	O	Spindle servo lock status monitor signal output to the system controller (IC801) Not used (open)
5	SWDT	I	Writing serial data signal input from the system controller (IC801)
6	SCLK	I (S)	Serial data transfer clock signal input from the system controller (IC801)
7	XLAT	I (S)	Serial data latch pulse signal input from the system controller (IC801)
8	SRDT	O (3)	Reading serial data signal output to the system controller (IC801)
9	SENS	O (3)	Internal status (SENSE) output to the system controller (IC801)
10	XRST	I (S)	Reset signal input from the system controller (IC801) “L”: reset
11	SQSY	O	Subcode Q sync (SCOR) output to the system controller (IC801) “L” is output every 13.3 msec Almost all, “H” is output
12	DQSY	O	Digital In U-bit CD format subcode Q sync (SCOR) output to the system controller (IC801) “L” is output every 13.3 msec Almost all, “H” is output
13	RECP	I	Laser power selection signal input from the system controller (IC801) “L”: playback mode, “H”: recording mode
14	XINT	O	Interrupt status output to the system controller (IC801)
15	TX	O	Magnetic head on/off signal output to the over write head drive (IC181)
16	OSCI	I	System clock signal (90.3168 MHz) input terminal
17	OSCO	O	System clock signal (512Fs=90.3168 MHz) output terminal Not used (open)
18	XTSL	I	Input terminal for the system clock frequency setting “L”: 45.1584 MHz, “H”: 90.3168 MHz (fixed at “H” in this set)
19	DIN0	I	Digital audio signal input terminal when recording mode (for CD signal input)
20	DIN1	I	Digital audio signal input terminal when recording mode (for digital optical input)
21	DOUT	O	Digital audio signal output terminal when playback mode
22	DATAI	I	Recording data input from the A/D converter (IC301)
23	LRCKI	I	L/R sampling clock signal (44.1 kHz) input from the D/A converter (IC300), A/D converter (IC301)
24	XBCKI	I	Bit clock signal (2.8224 MHz) input from the D/A converter (IC300), A/D converter (IC301)
25	ADDT	I	Recording data input terminal Not used (fixed at “L”)
26	DADT	O	Playback data output terminal Not used (open)
27	LRCK	O	L/R sampling clock signal (44.1 kHz) output terminal Not used (open)
28	XBCK	O	Bit clock signal (2.8224 MHz) output terminal Not used (open)
29	FS256	O	Clock signal (11.2896 MHz) output terminal Not used (open)
30	DVDD	—	Power supply terminal (+3.3V) (digital system)
31 to 34	A03 to A00	O	Address signal output to the D-RAM (IC152)
35	A10	O	Address signal output to the D-RAM (IC152)
36 to 40	A04 to A08	O	Address signal output to the D-RAM (IC152)
41	A11	O	Address signal output to the external D-RAM Not used (open)
42	DVSS	—	Ground terminal (digital system)
43	XOE	O	Output enable signal output to the D-RAM (IC152) “L” active

* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

Pin No.	Pin Name	I/O	Description
44	$\overline{\text{XCAS}}$	O	Column address strobe signal output to the D-RAM (IC152) “L” active
45	A09	O	Address signal output to the D-RAM (IC152)
46	$\overline{\text{XRAS}}$	O	Row address strobe signal output to the D-RAM (IC152) “L” active
47	$\overline{\text{XWE}}$	O	Write enable signal output to the D-RAM (IC152) “L” active
48	D1	I/O	Two-way data bus with the D-RAM (IC152)
49	D0	I/O	
50	D2	I/O	
51	D3	I/O	
52	MVCI	I (S)	Digital in PLL oscillation input from the external VCO Not used (fixed at “L”)
53	ASYO	O	Playback EFM full-swing output terminal
54	ASYI	I (A)	Playback EFM asymmetry comparator voltage input terminal
55	AVDD	—	Power supply terminal (+3.3V) (analog system)
56	BIAS	I (A)	Playback EFM asymmetry circuit constant current input terminal
57	RFI	I (A)	Playback EFM RF signal input from the CXA2523AR (IC101)
58	AVSS	—	Ground terminal (analog system)
59	PCO	O (3)	Phase comparison output for master clock of the recording/playback EFM master PLL
60	FILI	I (A)	Filter input for master clock of the recording/playback master PLL
61	FILO	O (A)	Filter output for master clock of the recording/playback master PLL
62	CLTV	I (A)	Internal VCO control voltage input of the recording/playback master PLL
63	PEAK	I (A)	Light amount signal (RF/ABCD) peak hold input from the CXA2523AR (IC101)
64	BOTM	I (A)	Light amount signal (RF/ABCD) bottom hold input from the CXA2523AR (IC101)
65	ABCD	I (A)	Light amount signal (ABCD) input from the CXA2523AR (IC101)
66	FE	I (A)	Focus error signal input from the CXA2523AR (IC101)
67	AUX1	I (A)	Auxiliary signal (I ₃ signal/temperature signal) input from the CXA2523AR (IC101)
68	VC	I (A)	Middle point voltage (+1.65V) input from the CXA2523AR (IC101)
69	ADIO	O (A)	Monitor output of the A/D converter input signal Not used (open)
70	AVDD	—	Power supply terminal (+3.3V) (analog system)
71	ADRT	I (A)	A/D converter operational range upper limit voltage input terminal (fixed at “H” in this set)
72	ADRB	I (A)	A/D converter operational range lower limit voltage input terminal (fixed at “L” in this set)
73	AVSS	—	Ground terminal (analog system)
74	SE	I (A)	Sled error signal input from the CXA2523AR (IC101)
75	TE	I (A)	Tracking error signal input from the CXA2523AR (IC101)
76	DCHG	I (A)	Connected to the +3.3V power supply
77	TEST4	I	Input terminal for the test Not used (fixed at “H”)
78	ADFG	I (S)	ADIP duplex FM signal (22.05 kHz $\pm$ 1 kHz) input from the CXA2523AR (IC101)
79	F0CNT	O	Filter f0 control signal output to the CXA2523AR (IC101)
80	XLRF	O	Serial data latch pulse signal output to the CXA2523AR (IC101)
81	CKRF	O	Serial data transfer clock signal output to the CXA2523AR (IC101)
82	DTRF	O	Writing serial data output to the CXA2523AR (IC101)
83	APCREF	O	Control signal output to the reference voltage generator circuit for the laser automatic power control
84	TEST0	O	Input terminal for the test Not used (open)
85	TRDR	O	Tracking servo drive PWM signal (–) output to the BH6511FS (IC141)
86	TFDR	O	Tracking servo drive PWM signal (+) output to the BH6511FS (IC141)
87	DVDD	—	Power supply terminal (+3.5V) (digital system)
88	FFDR	O	Focus servo drive PWM signal (+) output to the BH6511FS (IC141)

* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

Pin No.	Pin Name	I/O	Description
89	FRDR	O	Focus servo drive PWM signal (–) output to the BH6511FS (IC141)
90	FS4	O	Clock signal (176.4 kHz) output terminal (X’tal system) Not used (open)
91	SRDR	O	Sled servo drive PWM signal (–) output to the BH6511FS (IC141)
92	SFDR	O	Sled servo drive PWM signal (+) output to the BH6511FS (IC141)
93	SPRD	O	Spindle servo drive PWM signal (–) output to the BH6511FS (IC141)
94	SPFD	O	Spindle servo drive PWM signal (+) output to the BH6511FS (IC141)
95	FGIN	I (S)	Input terminal for the test (fixed at “L”)
96	TEST1	I	
97	TEST2	I	
98	TEST3	I	
99	DVSS	—	Ground terminal (digital system)
100	EFMO	O	EFM signal output terminal when recording mode

* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

• MAIN BOARD IC800 M30624MGA-A54FP (SYSTEM CONTROLLER (CD MECHANISM CONTROLLER))

Pin No.	Pin Name	I/O	Description
1	CD-DATA	O	Serial data output to the CD block
2	CD-CLK	O	Serial data transfer clock signal output to the CD block
3	XLT	O	Serial data latch pulse signal output to the CD block
4	SIRCS	I	Remote control signal input from the remote control receiver (IC781)
5	NC	O	Not used (open)
6	SQ-DATA	I	Subcode Q data input from the CD block
7	S-QCLK	O	Subcode Q data reading clock signal output to the CD block “L”: active
8	BYTE	I	External data bus line byte selection signal input “L”: 16 bit, “H”: 8 bit (fixed at “L”)
9	CNVSS	—	Ground terminal
10	HOLD	O	Laser power control signal output terminal Not used (open)
11	SENS	I	Internal status (SENSE) input from the CD block
12	RESET	I	System reset signal input from the reset signal generator (IC505) “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H”
13	X-OUT	O	Main system clock output terminal (10 MHz)
14	VSS	—	Ground terminal
15	X-IN	I	Main system clock input terminal (10 MHz)
16	VCC	—	Power supply terminal (+5V)
17	NMI	I	Non-maskable interrupt input terminal “L” active (fixed at “H” in this set)
18	P_DOWN	I	Power down detection signal input terminal “L”: power down, normally: “H”
19	SCOR	I	Subcode sync (S0+S1) detection signal input from the CD block “H”: active
20	TP	O	Not used (open)
21	EXT_ON	I	EXT_ON input terminal
22	CONNECT	I	Connect signal input terminal
23	TP	O	Not used (open)
24	LINE_MUTE	O	Audio line muting on/off control signal output “L”: line muting on
25	LDON	O	Laser diode on/off control signal output to the automatic power control circuit “H”: laser on
26	MD_RST	O	Reset signal output to the system controller (IC801)
27	DAC_MUTE	O	Muting control signal output to the D/A converter (IC300)
28	TP	O	Not used (open)
29	IIC-CLK	I/O	Communication data reading clock signal output or transfer clock signal input with the system controller (IC801)
30	IIC-DATA	I/O	Communication data bus with the system controller (IC801)
31	TXD1	O	Not used (open)
32	RXD1	O	Not used (open)
33	CLK1	O	Not used (open)
34	RTS1	O	Not used (open)
35	FLWRITE	O	Serial data output to the display controller (IC751)
36	FLREAD	I	Not used (fixed at “L”)
37	FLCLK	O	Serial data transfer clock signal output to the display controller (IC751)
38	FLCS	O	Serial data transfer request signal output to the display controller (IC751)
39	FLREQ	O	Serial data transfer request signal input terminal Not used (open)
40	FLBUSY	O	Serial data transfer permission signal input terminal Not used (open)
41	NC	O	Not used (fixed at “L”)
42	1-4	O	Disc speed selection (normal/4 speed) signal output to the CD block
43	1-2	O	Disc speed selection (normal/2 speed) signal output to the CD block
44	8-12	O	Disc size selection signal output to the CD block Not used (open)

Pin No.	Pin Name	I/O	Description
45	SPNDL_MUTE	O	Spindle motor muting control signal output to the CD block
46	NC	—	Not used (fixed at “H” in this set)
47 to 51	NC	—	Not used (open)
52	LED_RECMODE	O	LED on/off control signal output terminal Not used (open)
53	LED_DATA	O	LED control serial data output terminal Not used (open)
54	LED_CLK	O	LED control serial data transfer clock signal output terminal Not used (open)
55	LED_STB	O	LED control strobe signal output terminal Not used (open)
56 to 60	NC	—	Not used (open)
61	DISP_RESET	O	Reset signal output to the display controller (IC751)
62	VCC	—	Power supply terminal (+5V)
63	STB	O	Strobe signal output to the power supply circuit “L”: standby mode, “H”: power on
64	VSS	—	Ground terminal
65	JOGCD0	I	Jog dial pulse input from the rotary encoder (S701 ◀◀ AMS ▶▶ PUSH ENTER (CD)) B phase input
66	JOGCD1	I	Jog dial pulse input from the rotary encoder (S701 ◀◀ AMS ▶▶ PUSH ENTER (CD)) A phase input
67	JOGMD0	I	Jog dial pulse input from the rotary encoder (S721 ◀◀ AMS ▶▶ PUSH ENTER (MD)) B phase input
68	JOGMD1	I	Jog dial pulse input from the rotary encoder (S721 ◀◀ AMS ▶▶ PUSH ENTER (MD)) A phase input
69 to 72	NC	—	Not used (open)
73	LOAD_POS	O	CD loading motor (M702) control signal output to the motor driver IC (IC401) “L” active *1
74	LOAD_NEG	O	CD loading motor (M702) control signal output to the motor driver IC (IC401) “L” active *1
75	OUT_SW	I	Detection input from the tray open/close detect switch (S1) on the CD mechanism block “L”: when tray is open, “H”: when tray is close
76	MID_OUT_SW	I	Detection input from the mid out detect switch on the CD mechanism block “L”: when tray is going to open or close Not used (open)
77	IN_SW	I	Detection input from the tray open/close detect switch (S1) on the CD mechanism block “L”: when tray is close, “H”: when tray is open
78	MID_IN_SW	I	Detection input from the mid in detect switch on the CD mechanism block “L”: when sub tray move between tray and stocker Not used (open)
79	CLP_POS	O	CD elevator up/down motor control signal output terminal “L” active Not used (open)
80	CLP_NEG	O	CD elevator up/down motor (M701) control signal output terminal “L” active Not used (open)
81	INIT_SW	I	Detection input from the INIT detect switch on the CD mechanism block “L”: when elevator down to bottom, others: “H” Not used (open)
82	COUNT_SW	I	Detection input from the count detect switch on the CD mechanism block “L”: when elevator up/down each sub tray stock position Not used (open)
83	E3	I	Detection input from the disc tray address detect rotary encoder on the CD mechanism block Not used (open)
84	E1	I	
85	E2	I	

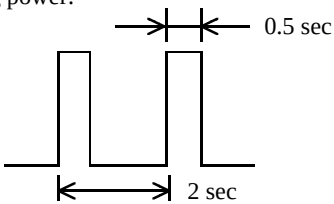
*1 CD loading motor (M702) control

Terminal \ Mode	Loading	Eject	Stop	Brake
LOAD NEG (pin ㉔)	“L”	“H”	“L”	“H”
LOAD POS (pin ㉓)	“H”	“L”	“L”	“H”

Pin No.	Pin Name	I/O	Description
86	DSENSE	I	Detection input from the disc in detect sensor on the CD mechanism block “H”: disc detected Not used (open)
87	PRTC_SW	I	Detection input from the CD tray door open/close detect switch input terminal “L”: when CD lid is open, “H”: when CD lid is close Not used (open)
88	SOFT_TEST	I	Not used (open)
89	KEY3	I	Key input terminal (A/D input) S741 to S746 (■ (MD), ■■ (MD), ▷ (MD), ►► (MD), REC●, ≡ EJECT keys input)
90	KEY2	I	Key input terminal (A/D input) S731 to S736 (◀◀ (MD), MENU/NO, YES, CD SYNCHRO HIGH, CD SYNCHRO NORMAL, ≡ OPEN/ CLOSE keys input)
91	KEY1	I	Key input terminal (A/D input) S721 to S729 (◀◀◀ AMS ▷▷▷ PUSH ENTER (MD) TIME/CHAR MD, PLAY MODE MD, INPUT, DISPLAY, PLAY MODE CD, TIME CD, CLEAR (CD) keys input)
92	KEY0	I	Key input terminal (A/D input) S701 to S707 (◀◀◀ AMS ▷▷▷ PUSH ENTER (CD), ■ (CD), ■■ (CD), ▷ (CD), REC-IT, ►► (CD), ◀◀ (CD), I/⏻ keys input)
93	SPEC_IN	I	Destination setting terminal (fixed at “H”)
94	LEVEL_L	I	L-ch level input from the MD mechanism controller (IC801)
95	LEVEL_R	I	R-ch level input from the MD mechanism controller (IC801)
96	AVSS	—	Ground terminal
97	TE	I	Tracking error signal input terminal Not used (open)
98	VREF	I	Reference voltage (+5V) input terminal (for A/D converter)
99	AVCC	—	Power supply terminal (+5V) (for analog system)
100	XRST	O	Reset signal output to the CD block

• MAIN BOARD IC801 M30803MG (MD MECHANISM CONTROLLER)

Pin No.	Pin Name	I/O	Description
1, 2	NC	O	Not used (open)
3	LEVEL_L	O	L-ch level output to the CD mechanism controller (IC800)
4	LEVEL_R	O	R-ch level output to the CD mechanism controller (IC800)
5 to 7	NC	O	Not used (open)
8	BYTE	I	External data bus line byte selection signal input “L”: 16 bit, “H”: 8 bit (fixed at “L”)
9	CNVSS	—	Ground terminal
10	XIN-T	I	Sub system clock input terminal Not used (open)
11	XOUT-T	O	Sub system clock output terminal Not used (open)
12	$\overline{\text{S-RST}}$	I	System reset signal input “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H”
13	XOUT	O	Main system clock output terminal (10 MHz)
14	GND	—	Ground terminal
15	XIN	I	Main system clock input terminal (10 MHz)
16	VCC	—	Power supply terminal (+3.5V)
17	NMI	I	Non-maskable interrupt input terminal “L” active (fixed at “H” in this set)
18	DQSY	I	Digital In U-bit CD format subcode Q sync (SCOR) input from the CXD2662R (IC151) “L” is input every 13.3 msec Almost all, “H” is input
19	P.DOWN	I	Power down detection signal input terminal “L”: power down, normally: “H”
20	SQSY	I	Subcode Q sync (SCOR) input from the CXD2662R (IC151) “L” is input every 13.3 msec Almost all, “H” is input
21 to 24	NC	O	Not used (open)
25	XINT	I	Interrupt status input from the CXD2662R (IC151)
26	NC	O	Not used (open)
27	NC (CLIP)	O	Serial data output terminal Not used (open)
28	NC	O	Not used (open)
29	IIC CLK	I/O	Communication data reading clock signal output or transfer clock signal input with the CD mechanism controller (IC800)
30	IIC DATA	I/O	Communication data bus with the CD mechanism controller (IC800)
31	SWDT	O	Writing data output to the CXD2662R (IC151)
32	SRDT	I	Reading data input from the CXD2662R (IC151)
33	SCLK	O	Serial clock signal output to the CXD2662R (IC151)
34	RST1	O	Not used (open)
35	NC (CLIP)	O	Serial clock signal output terminal Not used (open)
36	NC (CLIP)	O	Not used (open)
37	NC (CLIP)	I	Serial data input terminal Not used (open)
38 to 40	NC	O	Not used (open)
41	EPM	I	Not used (fixed at “L”)
42, 43	NC	O	Not used (open)
44	PROTECT	I	Rec-proof claw detect input from the protect detect switch (S102-2) “H”: write protect
45	SCL	O	Clock signal output to the EEPROM (IC195)
46	CE	I	Not used (fixed at “H”)
47	EEP-WP	O	Writing protect signal output to the EEPROM (IC195)
48	XBUSY	I	Busy signal input from the CXD2662R (IC151)
49	OUT-SW	I	Detection input from the loading-out detect switch (S103) “L” at a load-out position, others: “H”
50	XLATCH	O	Serial data latch pulse signal output to the CXD2662R (IC151)

Pin No.	Pin Name	I/O	Description
51	PLAY-SW	I	Detection input from the playback position detect switch (S104) “L” active
52	D.RESET	O	Reset signal output to the CXD2662R (IC151) and BH6511FS (IC152) “L”: reset
53	REC-SW	I	Detection input from the recording position detect switch (S105) “L” active
54	WRPWR	O	Laser power select signal output to the CXD2662R (IC151) and HF module switch circuit “L”: playback mode, “H”: recording mode
55	LIMIT IN	I	Detection input from the sled limit-in detect switch (S101) The optical pick-up is inner position when “L”
56	MOD	O	Laser modulation select signal output to the HF module switch circuit Stop: “L”, Playback power: “H”, Recording power: 
57	LD ON	O	Laser diode on/off control signal output to the automatic power control circuit “H”: laser on
58	SENS	I	Internal status (SENSE) input from the CXD2662R (IC151)
59	SHOCK	I	Track jump detection signal input from the CXD2662R (IC151)
60	SDA	I/O	Two-way data bus with the EEPROM (IC195)
61	REFRECT	I	Detection input from the disc reflection rate detect switch (S102-1) “L”: high reflection rate disc, “H”: low reflection rate disc
62	VCC	—	Power supply terminal (+3.5V)
63	NC	O	Not used (open)
64	GND	—	Ground terminal
65	LDAD LO	O	Loading motor drive voltage control signal output for the loading motor driver (IC400) “H” active
66	LOAD OUT	O	Motor control signal output to the loading motor driver (IC400) “L” active *1
67	LOAD IN	O	Motor control signal output to the loading motor driver (IC400) “L” active *1
68, 69	NC	O	Not used (open)
70, 71	J/OTHER	I	Destination setting input terminal (fixed at “L”)
72	SPDIF_CUT	O	MD/CD digital input control signal output to the MD/CD selector (IC307)
73 to 75	NC	O	Not used (open)
76	DAC_MUTE	O	Muting control signal output to the D/A converter (IC300) “L”: muting
77	LINE_MUTE	O	Audio line muting on/off control signal output
78	DA_RESET	O	Reset signal output to the D/A converter (IC300), A/D converter (IC301) “H”: reset
79	SLICER_SEL	O	IEC958 input selection signal output to the D/A converter (IC300) “L”: MD, “H”: CD
80	SPDIF_LOCK	I	Lock signal input from the D/A converter (IC300)

*1 Loading motor (M103) control

Terminal \ Mode	LOADING	EJECT	BRAKE	RUN IDLE
LOAD IN (pin ⑥7)	“L”	“H”	“H”	“L”
LOAD OUT (pin ⑥⑥)	“H”	“L”	“H”	“L”

Pin No.	Pin Name	I/O	Description
81 to 84	NC	O	Not used (open)
85 to 88	TP1-4	O	Not used (open)
89	IOP	I	Optical pick-up voltage input from the automatic power control circuit
90 to 95	NC	O	Not used (open)
96	AVSS	—	Ground terminal (for analog system)
97	NC	O	Not used (open)
98	VREF	I	Reference voltage (+3.5V) input terminal (for A/D converter)
99	AVCC	—	Power supply terminal (+3.5V) (for analog system)
100	NC	O	Not used (open)

SECTION 7

EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) . . . (RED)

↑
Parts Color

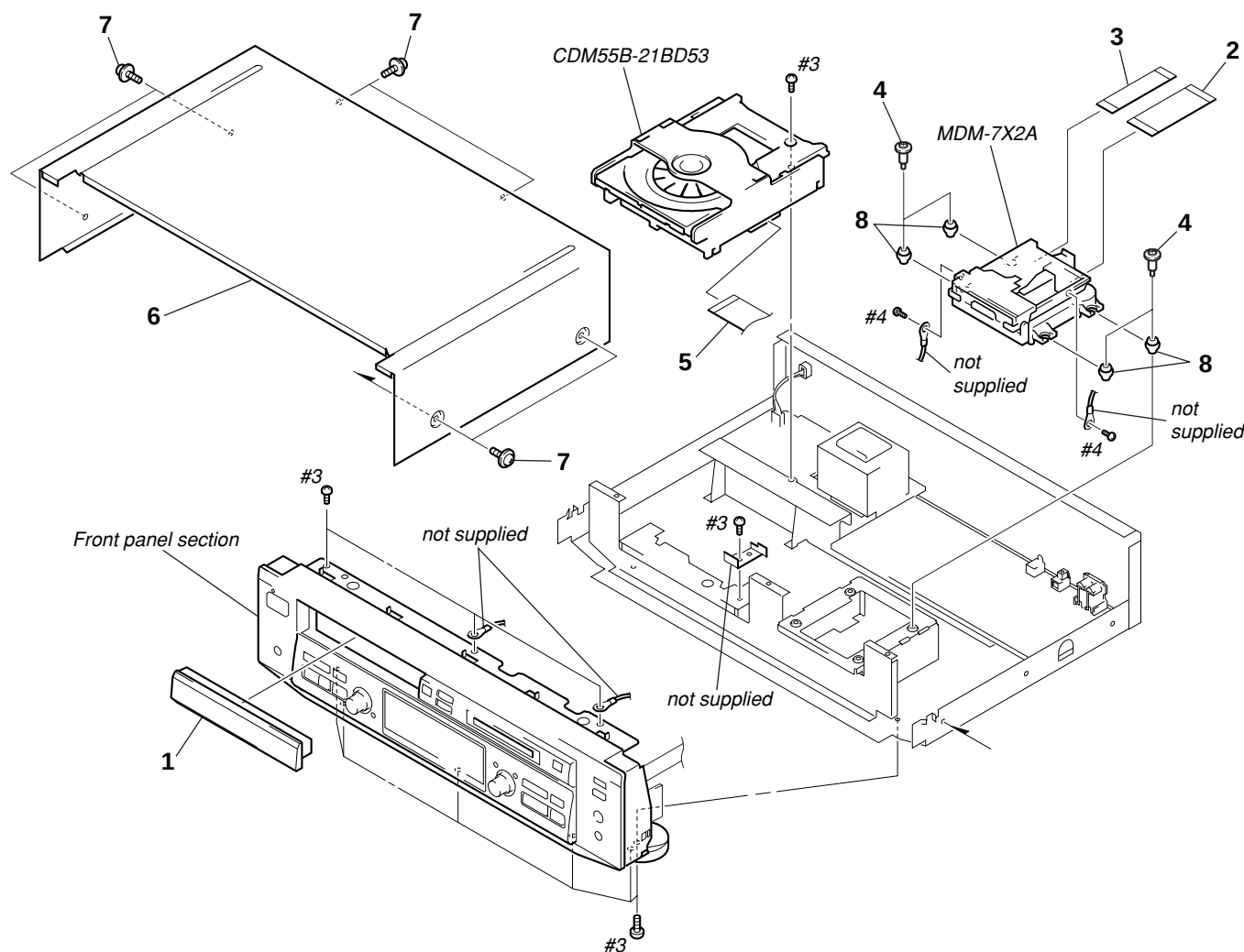
↑
Cabinet's Color

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

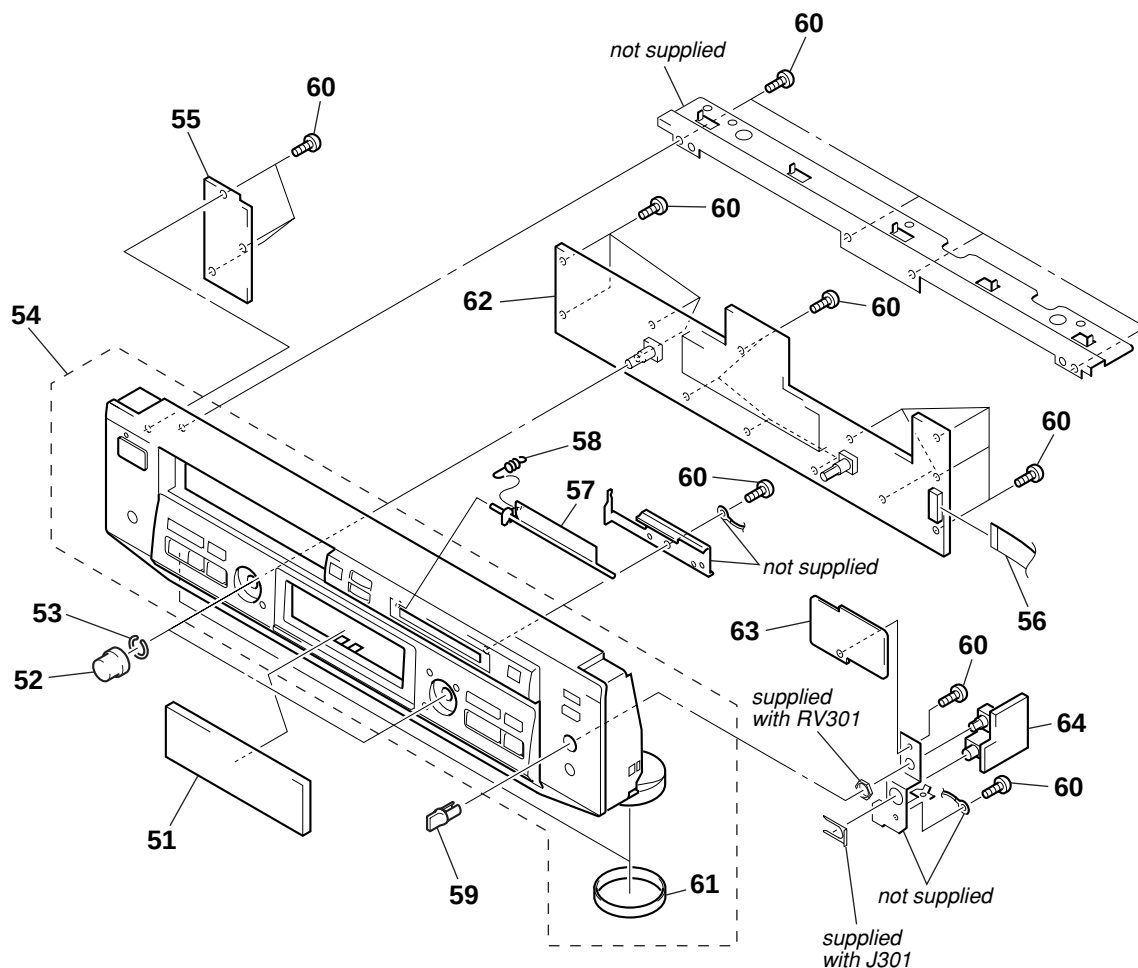
Les composants identifiés par une marque  sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

7-1. CASE SECTION

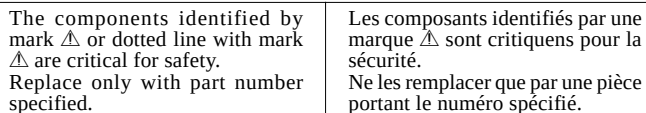


Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-229-435-01	PANEL, LOADING (BLACK)		* 6	3-931-432-01	CASE (410726) (BLACK)	
1	4-229-435-11	PANEL, LOADING (GOLD)		* 6	3-931-432-51	CASE (410726) (GOLD)	
2	1-792-812-11	WIRE (FLAT TYPE) (27 CORE)		7	4-210-291-01	SCREW (CASE 3 TP2) (for BLACK)	
3	1-792-817-11	WIRE (FLAT TYPE) (17 CORE)		7	4-210-291-11	SCREW (CASE 3 TP2) (for GOLD)	
4	4-228-643-11	SCREW (+BVTTWH M3), STEP		8	4-228-689-01	INSULATOR	
5	1-792-818-12	WIRE (FLAT TYPE) (21 CORE)					

7-2. FRONT PANEL SECTION

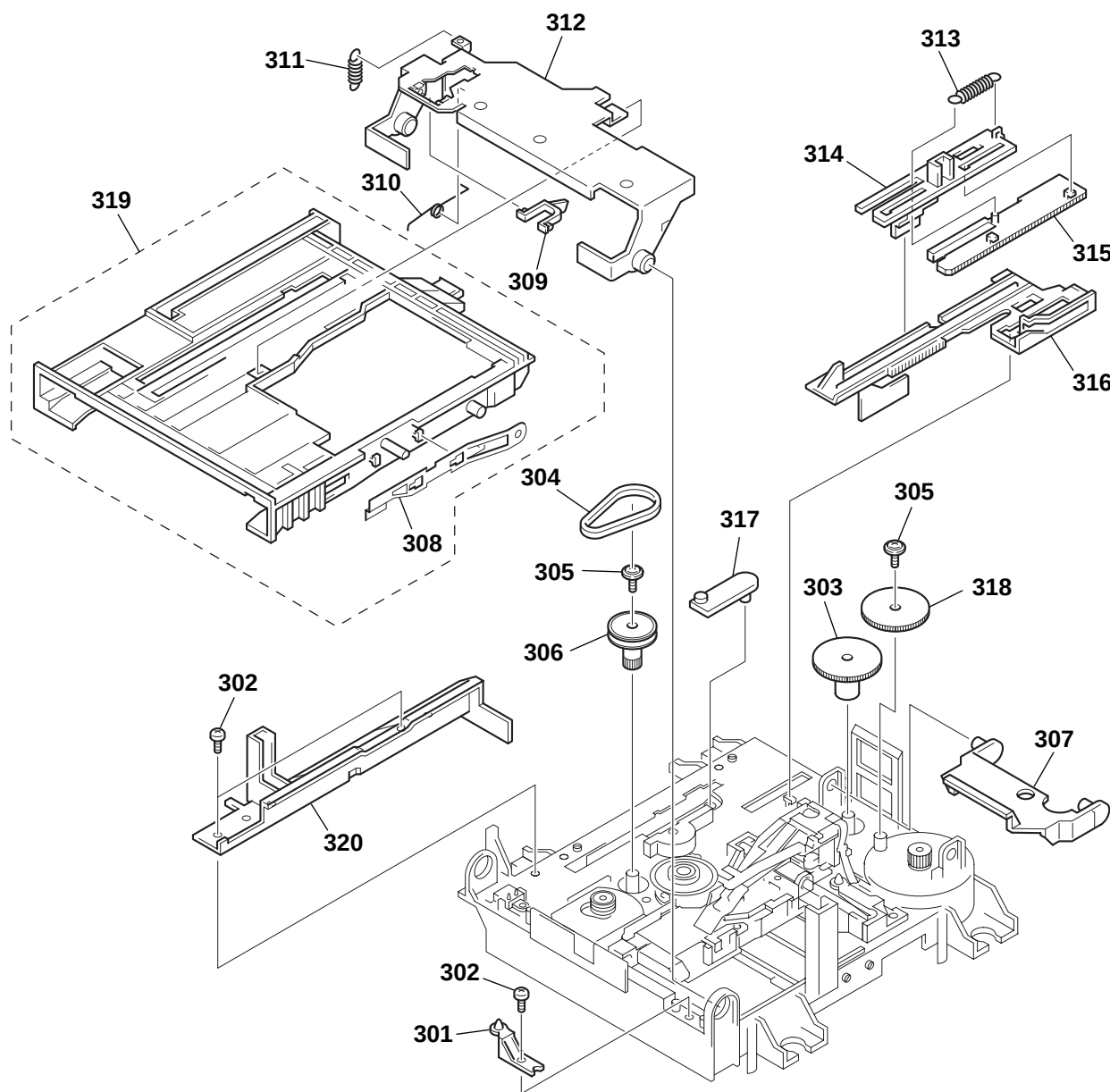


Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-220-710-01	PLATE, INDICATION		59	4-950-189-01	KNOB (A) (VOL) (BLACK)	
52	4-996-687-41	KNOB (AMS) (GOLD)		59	4-950-189-41	KNOB (A) (VOL) (GOLD)	
52	4-996-687-01	KNOB (AMS) (BLACK)		60	4-951-620-01	SCREW (2.6X8), +BVTP	
53	3-354-981-11	SPRING (SUS), RING		61	4-977-593-11	RING (DIA. 50), ORNAMENTAL	
54	X-4953-610-1	PANEL ASSY, FRONT (Singapore: GOLD)				(AEP, UK, Singapore: BLACK)	
54	X-4953-611-1	PANEL ASSY, FRONT (US, Canadian)		61	4-977-593-21	RING (DIA. 50), ORNAMENTAL	
54	X-4953-612-1	PANEL ASSY, FRONT				(Singapore: GOLD)	
		(AEP, UK, Singapore: BLACK)		62	A-4725-634-A	DISPLAY BOARD, COMPLETE (AEP, UK)	
55	1-677-766-11	PW SW BOARD		62	A-4725-641-A	DISPLAY BOARD, COMPLETE (US, Canadian)	
56	1-792-953-11	WIRE (FLAT TYPE) (18 CORE)		62	A-4725-648-A	DISPLAY BOARD, COMPLETE (Singapore)	
57	4-228-761-01	LID (CARTRIDGE) (BLACK)		63	1-677-767-11	LP LED BOARD	
57	4-228-761-11	LID (CARTRIDGE) (GOLD)		64	1-677-768-11	HP BOARD	
58	4-230-410-11	SPRING (LID), TENSION					



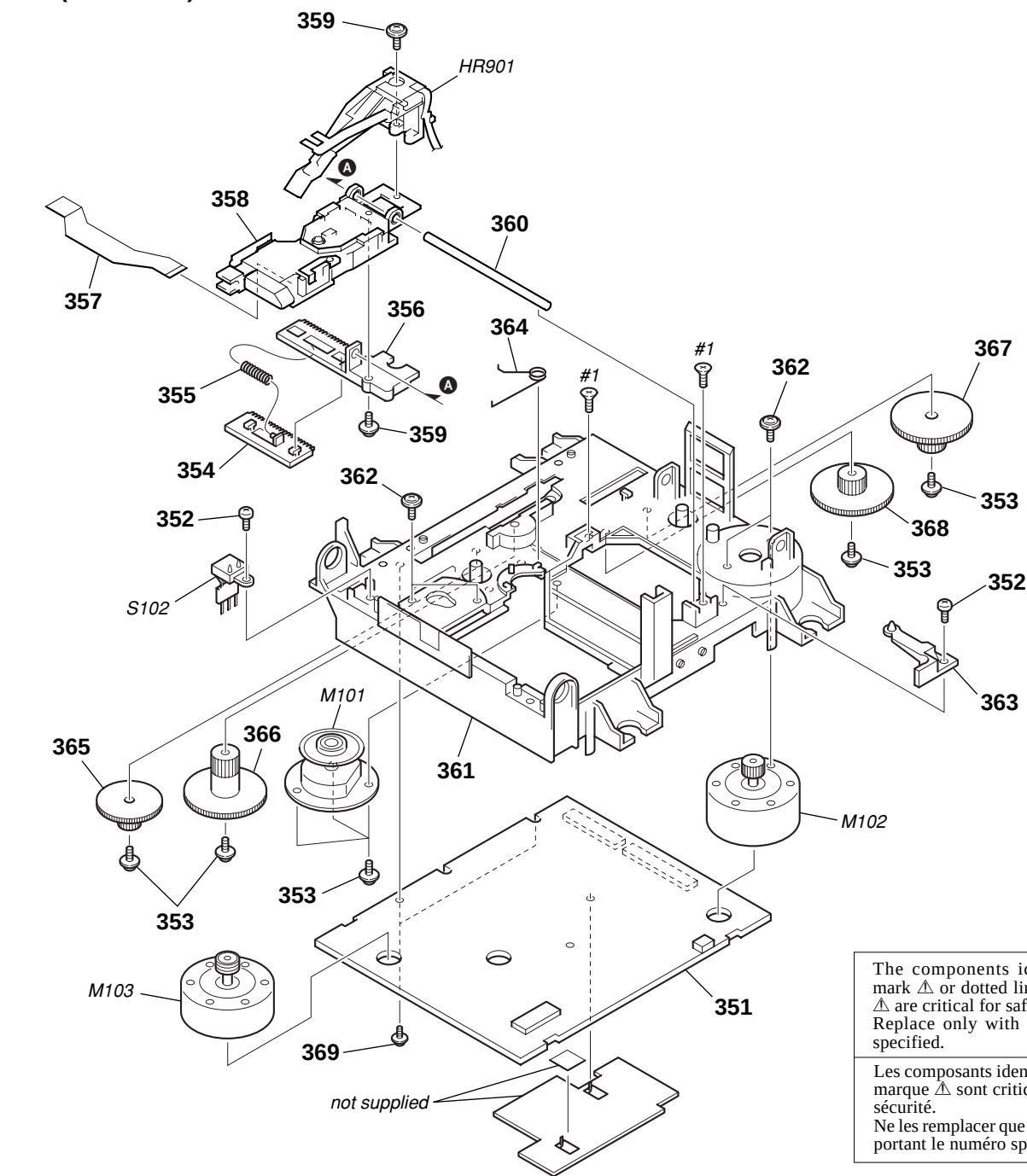
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	X-4947-208-1	FOOT ASSY (F50150S) (BLACK)		106	4-230-771-81	PANEL, BACK (Singapore)	
101	X-4952-298-1	FOOT ASSY (F50150S) (GOLD)		107	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6	
102	4-977-358-11	CUSHION		△ 108	1-777-071-21	CORD, POWER (AEP)	
103	1-569-972-21	SOCKET, SHORT 2P		△ 108	1-777-071-61	CORD, POWER (Singapore)	
104	A-4725-638-A	MAIN BOARD COMPLETE (AEP, UK)		△ 108	1-783-820-11	CORD, POWER (US, Canadian)	
104	A-4725-645-A	MAIN BOARD COMPLETE (US, Canadian)		△ 108	1-790-226-11	CORD, POWER (UK)	
104	A-4725-653-A	MAIN BOARD COMPLETE (Singapore)		109	1-677-769-11	TRANS BOARD (EXCEPT Singapore)	
* 105	3-703-244-00	BUSHING (2104), CORD (AEP, UK, Singapore)		109	1-679-008-11	TRANS (SP) BOARD (Singapore)	
105	4-966-267-12	BUSHING (FBS001), CORD (US, Canadian)		110	1-679-722-11	LF BOARD (Singapore)	
106	4-230-771-51	PANEL, BACK (US)		△ T601	1-435-650-11	TRANSFORMER, POWER (Singapore)	
106	4-230-771-61	PANEL, BACK (Canadian)		△ T651	1-435-648-11	TRANSFORMER, POWER (US, Canadian)	
106	4-230-771-71	PANEL, BACK (AEP, UK)		△ T651	1-435-649-11	TRANSFORMER, POWER (AEP, UK)	

7-4. MD MECHANISM DECK SECTION-1 (MDM-7X2A)



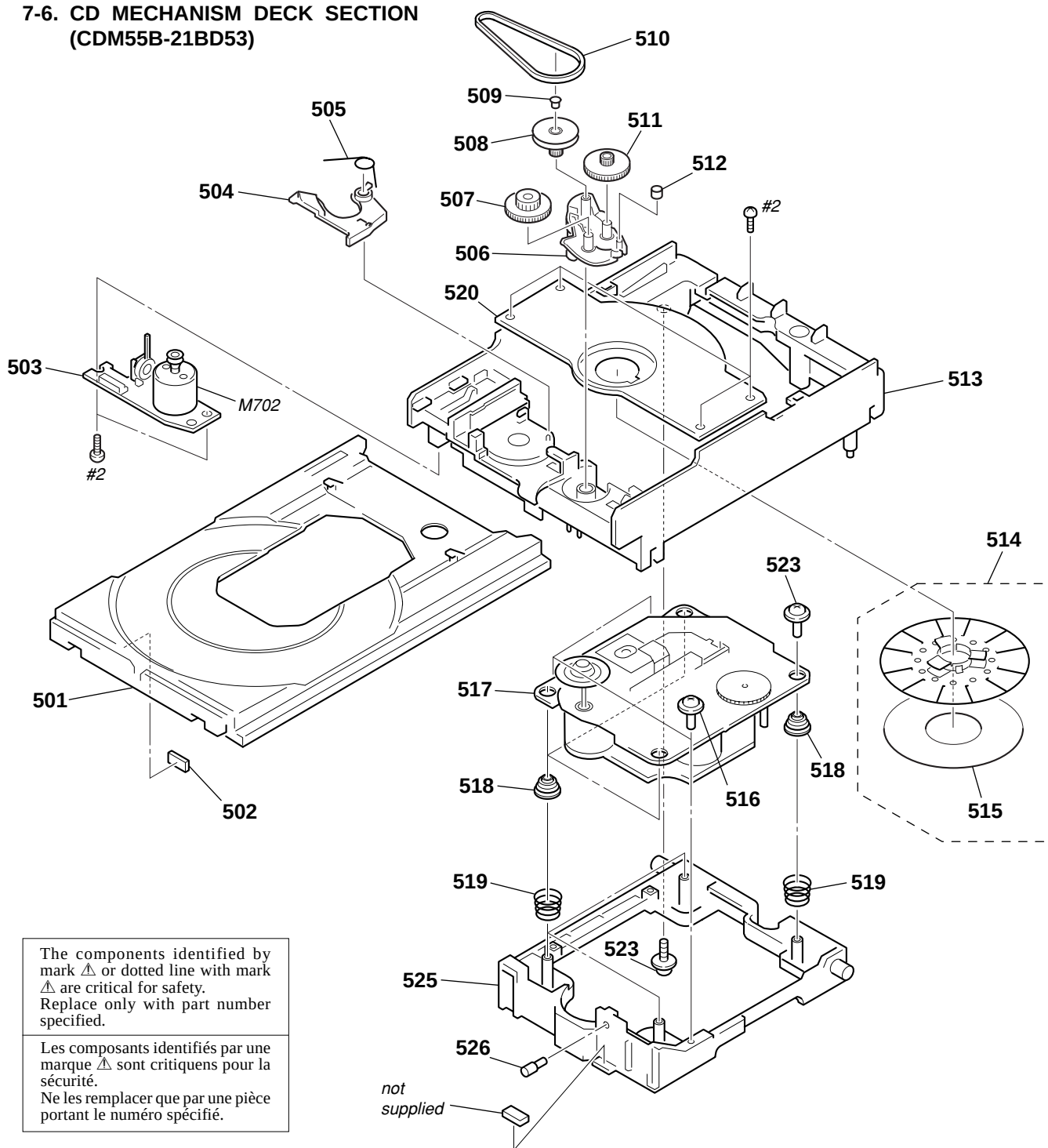
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 301	4-996-267-01	BASE (BU-D)		311	4-227-012-01	SPRING (HOLDER), TENSION	
302	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI		312	4-227-019-02	PLATE (HOLDER), RETAINER	
303	4-227-007-01	GEAR (SB)		313	4-227-013-01	SPRING (EJ), TENSION	
304	4-227-025-01	BELT (LOADING)		314	4-226-995-01	SLIDER (EJ)	
305	3-372-761-01	SCREW (M1.7), TAPPING		315	4-226-996-01	LIMITER (EJ)	
306	4-227-002-01	GEAR, PULLEY		316	4-226-997-04	SLIDER	
307	4-226-999-01	LEVER (HEAD)		317	4-226-998-01	LEVER (CHG)	
308	X-4952-665-1	SPRING (SHT) ASSY, LEAF		318	4-227-006-01	GEAR (SA)	
309	A-4672-990-F	LOCK (HOLDER)		319	A-4735-075-A	HOLDER ASSY	
310	4-229-533-02	SPRING (STOPPER), TORSION		320	4-226-994-01	GUIDE (L)	

7-5. MD MECHANISM DECK SECTION-2 (MDM-7X2A)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
351	A-4725-430-A	BD (MD) BOARD, COMPLETE		364	4-230-716-01	SPRING (SPDL), TORSION	
352	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI		365	4-227-004-01	GEAR (LC)	
353	3-372-761-01	SCREW (M1.7), TAPPING		366	4-227-005-01	GEAR (LD)	
354	4-226-993-01	RACK		367	4-227-008-01	GEAR (SC)	
355	4-227-014-01	SPRING (RACK), COMPRESSION		368	4-227-009-01	GEAR (SD)	
356	4-226-992-01	BASE, SL		369	4-232-270-01	SCREW (1.7X3.5), +PWH	
357	1-678-514-11	FLEXIBLE BOARD		HR901	1-500-670-11	HEAD, OVER WRITE	
Δ 358	A-4672-976-A	OPTICAL PICK-UP KMS-262A		M101	A-4735-029-A	MOTOR ASSY, SPINDLE (for MD)	
359	4-988-560-01	SCREW (+P 1.7X6)		M102	A-4672-900-A	MOTOR ASSY, SLED (for MD)	
360	4-996-265-01	SHAFT, MAIN		M103	A-4672-975-A	MOTOR ASSY, LOADING (for MD)	
361	4-226-989-01	CHASSIS		S102	1-771-957-11	SWITCH, PUSH (2 KEY) (REFLECT RATE DETECT, PROTECT DETECT)	
362	4-211-036-01	SCREW (1.7X2.5), +PWH					
363	4-226-990-01	BASE (BU-A)					

7-6. CD MECHANISM DECK SECTION (CDM55B-21BD53)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
501	4-226-180-01	TRAY (55-L)		513	4-227-236-01	CHASSIS (CDM55C)	
502	4-925-315-31	DAMPER		514	X-4953-233-1	PULLEY (AT) ASSY	
503	1-674-336-21	LOADING BOARD		515	4-220-951-02	SHEET (KH)	
504	4-220-229-01	LEVER (SW)		516	4-227-899-21	SCREW (DIA. 12), FLOATING	
505	4-220-239-11	SPRING, TORSION		Δ 517	A-4677-295-A	BU-21BD53	
506	4-220-233-01	CAM (CDM55)		518	4-230-386-01	INSULATOR (BU21)	
507	4-220-238-01	GEAR (B)		519	4-230-389-01	SPRING, CONE COIL	
508	4-220-234-01	PULLEY (LDG)		520	4-227-218-21	HOLDER (AT)	
509	4-227-598-01	SPACER (55)		523	4-985-672-01	SCREW (+PTPWHM2.6), FLOATING	
510	4-221-816-11	BELT (CDM55)		525	4-228-353-11	HOLDER (55-BU21)	
511	4-220-237-01	GEAR (A)		526	4-229-358-01	SHAFT (BU21)	
512	4-221-815-11	ROLLER		M702	A-4672-771-A	MOTOR (LD) ASSY (LOADING) (for CD)	

SECTION 8
ELECTRICAL PARTS LIST

BD (MD)

- NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
 - -XX and -X mean standardized parts, so they may have some difference from the original one.
 - RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA. . : μ A. . uPA. . : μ PA. .
uPB. . : μ PB. . uPC. . : μ PC. .
uPD. . : μ PD. .
- CAPACITORS
uF: μ F
- COILS
uH: μ H

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-4725-430-A	BD (MD) BOARD, COMPLETE					

		< CAPACITOR >					
C101	1-135-259-11	TANTAL. CHIP 10uF	20% 6.3V	C158	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C102	1-135-259-11	TANTAL. CHIP 10uF	20% 6.3V	C159	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C103	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V	C160	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C104	1-164-227-11	CERAMIC CHIP 0.022uF	10% 25V	C161	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C105	1-115-416-11	CERAMIC CHIP 0.001uF	5% 25V	C162	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C106	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V	C163	1-125-891-11	CERAMIC CHIP 0.47uF	10% 10V
C107	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V	C164	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C108	1-162-969-11	CERAMIC CHIP 0.0068uF	10% 25V	C165	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V
C109	1-164-677-11	CERAMIC CHIP 0.033uF	10% 16V	C166	1-125-891-11	CERAMIC CHIP 0.47uF	10% 10V
C110	1-163-038-11	CERAMIC CHIP 0.1uF	25V	C167	1-164-245-11	CERAMIC CHIP 0.015uF	10% 25V
C111	1-117-720-11	CERAMIC CHIP 4.7uF	10V	C169	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C112	1-110-563-11	CERAMIC CHIP 0.068uF	10% 16V	C173	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C113	1-162-968-11	CERAMIC CHIP 0.0047uF	10% 50V	C174	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C114	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C180	1-117-370-11	CERAMIC CHIP 10uF	10V
C115	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V	C181	1-126-206-11	ELECT CHIP 100uF	20% 6.3V
C116	1-164-227-11	CERAMIC CHIP 0.022uF	10% 25V	C182	1-163-038-11	CERAMIC CHIP 0.1uF	25V
C117	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V	C183	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C118	1-165-176-11	CERAMIC CHIP 0.047uF	10% 16V	C184	1-117-970-11	ELECT CHIP 22uF	20% 10V
C119	1-165-176-11	CERAMIC CHIP 0.047uF	10% 16V	C185	1-128-795-11	ELECT CHIP 470PF	10% 630V
C120	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C191	1-126-206-11	ELECT CHIP 100uF	20% 6.3V
C121	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C192	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C125	1-117-720-11	CERAMIC CHIP 4.7uF	10V	C193	1-126-206-11	ELECT CHIP 100uF	20% 6.3V
C128	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C194	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C131	1-117-720-11	CERAMIC CHIP 4.7uF	10V	C195	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C132	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C196	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C133	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C1401	1-117-720-11	CERAMIC CHIP 4.7uF	10V
C141	1-126-206-11	ELECT CHIP 100uF	20% 6.3V			< CONNECTOR >	
C142	1-164-156-11	CERAMIC CHIP 0.1uF	25V	CN101	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P	
C143	1-164-156-11	CERAMIC CHIP 0.1uF	25V	CN102	1-784-835-21	CONNECTOR, FFC (LIF (NON-ZIF)) 27P	
C144	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V	CN103	1-784-869-21	CONNECTOR, FFC (LIF (NON-ZIF)) 17P	
C145	1-164-156-11	CERAMIC CHIP 0.1uF	25V	* CN104	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
C146	1-117-720-11	CERAMIC CHIP 4.7uF	10V	CN105	1-784-859-21	CONNECTOR, FFC (LIF (NON-ZIF)) 7P	
C147	1-117-720-11	CERAMIC CHIP 4.7uF	10V			< DIODE >	
C151	1-117-370-11	CERAMIC CHIP 10uF	10V	D101	8-719-988-61	DIODE 1SS355TE-17	
C152	1-164-156-11	CERAMIC CHIP 0.1uF	25V	D181	8-719-046-86	DIODE F1J6TP	
C153	1-164-156-11	CERAMIC CHIP 0.1uF	25V	D183	8-719-046-86	DIODE F1J6TP	
C154	1-126-206-11	ELECT CHIP 100uF	20% 6.3V			< IC >	
C155	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC101	8-752-080-95	IC CXA2523AR	
C156	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC102	8-759-473-51	IC TLV2361CDBV	
C157	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC141	8-759-836-79	IC BH6519FS-E2	

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
IC151	8-752-404-64	IC CXD2662R				R110	1-216-845-11	METAL CHIP 100K	5%	1/16W	
IC152	8-759-599-51	IC MSM51V17400D-50TS-K				R111	1-216-833-11	METAL CHIP 10K	5%	1/16W	
IC181	8-759-481-17	IC MC74ACT08DTR2				R112	1-216-829-11	METAL CHIP 4.7K	5%	1/16W	
IC190	8-759-677-64	IC L88M35T				R113	1-216-833-11	METAL CHIP 10K	5%	1/16W	
IC195	8-759-640-41	IC BR24C08F-E2				R114	1-216-827-11	METAL CHIP 3.3K	5%	1/16W	
		< JUMPER RESISTOR >				R115	1-216-833-11	METAL CHIP 10K	5%	1/16W	
JW201	1-216-295-11	SHORT 0				R116	1-216-839-11	METAL CHIP 33K	5%	1/16W	
JW202	1-216-295-11	SHORT 0				R117	1-216-837-11	METAL CHIP 22K	5%	1/16W	
JW203	1-216-295-11	SHORT 0				R118	1-218-855-11	METAL CHIP 2.2K	0.5%	1/16W	
JW903	1-216-295-11	SHORT 0				R119	1-218-863-11	METAL CHIP 4.7K	0.5%	1/16W	
JW904	1-216-295-11	SHORT 0				R120	1-218-889-11	METAL CHIP 56K	0.5%	1/16W	
		< COIL >				R121	1-218-863-11	METAL CHIP 4.7K	0.5%	1/16W	
L101	1-500-245-11	FERRITE 0uH				R122	1-218-855-11	METAL CHIP 2.2K	0.5%	1/16W	
L102	1-500-245-11	FERRITE 0uH				R123	1-216-819-11	METAL CHIP 680	5%	1/16W	
L103	1-500-245-11	FERRITE 0uH				R124	1-216-809-11	METAL CHIP 100	5%	1/16W	
L105	1-414-235-22	FERRITE 0uH				R125	1-216-815-11	METAL CHIP 330	5%	1/16W	
L106	1-500-245-11	FERRITE 0uH				R126	1-216-819-11	METAL CHIP 680	5%	1/16W	
L121	1-500-245-11	FERRITE 0uH				R127	1-216-845-11	METAL CHIP 100K	5%	1/16W	
L122	1-500-245-11	FERRITE 0uH				R128	1-219-724-11	METAL CHIP 1	1%	1/4W	
L131	1-500-245-11	FERRITE 0uH				R129	1-216-298-00	METAL CHIP 2.2	5%	1/10W	
L142	1-412-032-11	INDUCTOR CHIP 100uH				R130	1-216-829-11	METAL CHIP 4.7K	5%	1/16W	
L143	1-412-029-11	INDUCTOR CHIP 10uH				R131	1-216-837-11	METAL CHIP 22K	5%	1/16W	
L141	1-412-029-11	INDUCTOR CHIP 10uH				R132	1-216-840-11	METAL CHIP 39K	5%	1/16W	
L144	1-412-032-11	INDUCTOR CHIP 100uH				R133	1-216-821-11	METAL CHIP 1K	5%	1/16W	
L145	1-412-032-11	INDUCTOR CHIP 100uH				R134	1-216-821-11	METAL CHIP 1K	5%	1/16W	
L146	1-469-855-21	FERRITE 0uH				R135	1-216-821-11	METAL CHIP 1K	5%	1/16W	
L147	1-469-855-21	FERRITE 0uH				R136	1-216-302-00	METAL CHIP 2.7	5%	1/10W	
L161	1-500-245-11	FERRITE 0uH				R138	1-216-833-11	METAL CHIP 10K	5%	1/16W	
L171	1-500-245-11	FERRITE 0uH				R150	1-216-833-11	METAL CHIP 10K	5%	1/16W	
L180	1-469-855-21	FERRITE 0uH				R151	1-216-833-11	METAL CHIP 10K	5%	1/16W	
L181	1-469-855-21	FERRITE 0uH				R153	1-216-833-11	METAL CHIP 10K	5%	1/16W	
L182	1-500-245-11	FERRITE 0uH				R155	1-216-864-11	SHORT 0			
L183	1-216-296-11	SHORT 0				R156	1-216-864-11	SHORT 0			
L184	1-216-296-11	SHORT 0				R158	1-216-809-11	METAL CHIP 100	5%	1/16W	
		< TRANSISTOR >				R162	1-216-833-11	METAL CHIP 10K	5%	1/16W	
Q101	8-729-403-35	TRANSISTOR UN5113				R167	1-216-833-11	METAL CHIP 10K	5%	1/16W	
Q121	8-729-403-35	TRANSISTOR UN5113				R168	1-216-845-11	METAL CHIP 100K	5%	1/16W	
Q122	8-729-101-07	TRANSISTOR 2SB798-DL				R169	1-216-855-11	METAL CHIP 680K	5%	1/16W	
Q131	8-729-026-53	TRANSISTOR 2SA1576A-T106-QR				R170	1-216-827-11	METAL CHIP 3.3K	5%	1/16W	
Q132	8-729-903-10	TRANSISTOR FMW1				R171	1-216-821-11	METAL CHIP 1K	5%	1/16W	
Q133	8-729-402-93	TRANSISTOR UN5214				R173	1-216-821-11	METAL CHIP 1K	5%	1/16W	
Q134	8-729-402-93	TRANSISTOR UN5214				R174	1-216-811-11	METAL CHIP 150	5%	1/16W	
Q181	8-729-048-87	TRANSISTOR 2SJ518AZTR				R177	1-216-805-11	METAL CHIP 47	5%	1/16W	
Q182	8-729-048-88	TRANSISTOR 2SK2788VYTR				R179	1-216-295-11	SHORT 0			
		< RESISTOR >				R181	1-216-841-11	METAL CHIP 47K	5%	1/16W	
R101	1-216-829-11	METAL CHIP 4.7K 5%	1/16W			R182	1-216-841-11	METAL CHIP 47K	5%	1/16W	
R102	1-216-853-11	METAL CHIP 470K 5%	1/16W			R183	1-216-841-11	METAL CHIP 47K	5%	1/16W	
R103	1-216-863-11	RES-CHIP 3.3M 5%	1/16W			R185	1-216-295-11	SHORT 0			
R104	1-216-853-11	METAL CHIP 470K 5%	1/16W			R195	1-216-833-11	METAL CHIP 10K	5%	1/16W	
R105	1-216-825-11	METAL CHIP 2.2K 5%	1/16W			R196	1-216-833-11	METAL CHIP 10K	5%	1/16W	
R106	1-216-825-11	METAL CHIP 2.2K 5%	1/16W			R197	1-216-833-11	METAL CHIP 10K	5%	1/16W	
R107	1-216-825-11	METAL CHIP 2.2K 5%	1/16W			R218	1-216-864-11	SHORT 0			
R108	1-216-833-11	METAL CHIP 10K 5%	1/16W					< SWITCH >			
R109	1-216-845-11	METAL CHIP 100K 5%	1/16W			S101	1-762-596-21	SWITCH, PUSH (1 KEY) (LIMIT IN)			
						S103	1-771-956-21	SWITCH, PUSH (1 KEY) (PACK OUT)			
						S104	1-771-955-21	SWITCH, PUSH (1 KEY) (PLAY POSITION)			

BD (MD)

DISPLAY

Ref. No.	Part No.	Description	Remark			
S105	1-771-955-21	SWITCH, PUSH (1 KEY) (REC POSITION)				
< VIBRATOR >						
X171	1-781-569-21	OSCILLATOR, CRYSTAL (90.3168MHz)				

	A-4725-634-A	DISPLAY BOARD, COMPLETE (AEP, UK)				
	A-4725-641-A	DISPLAY BOARD, COMPLETE (US, Canadian)				
	A-4725-648-A	DISPLAY BOARD, COMPLETE (Singapore)				

	3-362-478-01	HOLDER (T), LED				
*	4-955-901-01	CUSHION (FL)				
*	4-996-686-03	HOLDER (FL)				
< CAPACITOR >						
C751	1-162-290-31	CERAMIC	470PF	10%	50V	
C752	1-162-290-31	CERAMIC	470PF	10%	50V	
C753	1-164-159-11	CERAMIC	0.1uF		50V	
C754	1-126-795-11	ELECT	10uF	20%	50V	
C755	1-164-159-11	CERAMIC	0.1uF		50V	
C756	1-162-290-31	CERAMIC	470PF	10%	50V	
C757	1-162-290-31	CERAMIC	470PF	10%	50V	
C758	1-162-290-31	CERAMIC	470PF	10%	50V	
C759	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C760	1-162-215-31	CERAMIC	47PF	5%	50V	
C761	1-126-795-11	ELECT	10uF	20%	50V	
C762	1-126-795-11	ELECT	10uF	20%	50V	
C792	1-164-159-11	CERAMIC	0.1uF		50V	
< CONNECTOR >						
CN701	1-779-555-21	CONNECTOR, FFC (LIF (NON-ZIF)) 18P				
* CN702	1-691-670-11	CONNECTOR, BOARD TO BOARD 5P				
< DIODE >						
D751	8-719-046-44	LED SEL5221S (NORMAL CD SYNCHRO)				
D752	8-719-046-44	LED SEL5221S (HIGH CD SYNCHRO)				
< CONNECTOR >						
* EPT792	1-690-880-31	LEAD (WITH CONNECTOR)				
< FILTER >						
FL751	1-517-998-11	INDICATOR TUBE, FLUORESCENT				
< IC >						
IC751	8-759-680-17	IC MSM9201-04GS-K				
< TRANSISTOR >						
Q751	8-729-900-80	TRANSISTOR	DTC114ES			
Q752	8-729-900-80	TRANSISTOR	DTC114ES			
Q753	8-729-620-05	TRANSISTOR	2SC2603-EF			
Q754	8-729-620-05	TRANSISTOR	2SC2603-EF			
Q791	8-729-900-80	TRANSISTOR	DTC114ES			
< RESISTOR >						
R701	1-249-411-11	CARBON	330	5%	1/4W	
R702	1-249-413-11	CARBON	470	5%	1/4W	
R703	1-249-415-11	CARBON	680	5%	1/4W	

Ref. No.	Part No.	Description	Remark		
R704	1-249-417-11	CARBON	1K	5%	1/4W
R705	1-249-419-11	CARBON	1.5K	5%	1/4W
R706	1-249-421-11	CARBON	2.2K	5%	1/4W
R707	1-249-425-11	CARBON	4.7K	5%	1/4W
R721	1-249-411-11	CARBON	330	5%	1/4W
R722	1-249-413-11	CARBON	470	5%	1/4W
R723	1-249-415-11	CARBON	680	5%	1/4W
R724	1-249-417-11	CARBON	1K	5%	1/4W
R725	1-249-419-11	CARBON	1.5K	5%	1/4W
R726	1-249-421-11	CARBON	2.2K	5%	1/4W
R727	1-249-425-11	CARBON	4.7K	5%	1/4W
R728	1-249-429-11	CARBON	10K	5%	1/4W
R731	1-249-411-11	CARBON	330	5%	1/4W
R732	1-249-413-11	CARBON	470	5%	1/4W
R733	1-249-415-11	CARBON	680	5%	1/4W
R734	1-249-417-11	CARBON	1K	5%	1/4W
R735	1-249-419-11	CARBON	1.5K	5%	1/4W
R741	1-249-411-11	CARBON	330	5%	1/4W
R742	1-249-413-11	CARBON	470	5%	1/4W
R743	1-249-415-11	CARBON	680	5%	1/4W
R744	1-249-417-11	CARBON	1K	5%	1/4W
R745	1-249-419-11	CARBON	1.5K	5%	1/4W
R746	1-249-421-11	CARBON	2.2K	5%	1/4W
R751	1-249-409-11	CARBON	220	5%	1/4W
R752	1-249-409-11	CARBON	220	5%	1/4W
R753	1-247-807-31	CARBON	100	5%	1/4W
R754	1-247-807-31	CARBON	100	5%	1/4W
R755	1-249-441-11	CARBON	100K	5%	1/4W
R756	1-249-441-11	CARBON	100K	5%	1/4W
R757	1-247-807-31	CARBON	100	5%	1/4W
R758	1-247-807-31	CARBON	100	5%	1/4W
R759	1-247-807-31	CARBON	100	5%	1/4W
R760	1-247-807-31	CARBON	100	5%	1/4W
R761	1-247-843-11	CARBON	3.3K	5%	1/4W
R762	1-249-429-11	CARBON	10K	5%	1/4W
< SWITCH >					
S701	1-475-543-11	ENCODER, ROTARY	(I<<< AMS >>>I ENTER (CD))		
S702	1-762-875-21	SWITCH, KEYBOARD (■ (CD))			
S703	1-762-875-21	SWITCH, KEYBOARD (II (CD))			
S704	1-762-875-21	SWITCH, KEYBOARD (▷ (CD))			
S705	1-762-875-21	SWITCH, KEYBOARD (REC-IT)			
S706	1-762-875-21	SWITCH, KEYBOARD (▶▶ (CD))			
S707	1-762-875-21	SWITCH, KEYBOARD (◀◀ (CD))			
S721	1-475-543-11	ENCODER, ROTARY	(I<<< AMS >>>I PUSH ENTER (MD))		
S722	1-762-875-21	SWITCH, KEYBOARD (CLEAR (MD))			
S723	1-762-875-21	SWITCH, KEYBOARD (TIME/CHAR MD)			
S724	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE MD)			
S725	1-762-875-21	SWITCH, KEYBOARD (INPUT)			
S726	1-762-875-21	SWITCH, KEYBOARD (DISPLAY)			
S727	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE CD)			
S728	1-762-875-21	SWITCH, KEYBOARD (TIME CD)			
S729	1-762-875-21	SWITCH, KEYBOARD (CLEAR (CD))			
S731	1-762-875-21	SWITCH, KEYBOARD (◀◀ (MD))			
S732	1-762-875-21	SWITCH, KEYBOARD (YES)			
S733	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)			

DISPLAY

HP

LF

LOADING

LP LED

MAIN

Ref. No.	Part No.	Description	Remark			
S734	1-762-875-21	SWITCH, KEYBOARD (HIGH CD SYNCHRO)				
S735	1-762-875-21	SWITCH, KEYBOARD (NORMAL CD SYNCHRO)				
S736	1-762-875-21	SWITCH, KEYBOARD (≡ OPEN/CLOSE)				
S741	1-762-875-21	SWITCH, KEYBOARD (■ (MD))				
S742	1-762-875-21	SWITCH, KEYBOARD (▣ (MD))				
S743	1-762-875-21	SWITCH, KEYBOARD (▷ (MD))				
S744	1-762-875-21	SWITCH, KEYBOARD (▶▶ (MD))				
S745	1-762-875-21	SWITCH, KEYBOARD (● REC)				
S746	1-762-875-21	SWITCH, KEYBOARD (≡ EJECT)				

	1-677-768-11	HP BOARD				

		< CAPACITOR >				
C359	1-162-290-31	CERAMIC	470PF	10%	50V	
C360	1-164-159-11	CERAMIC	0.1uF		50V	
C361	1-162-290-31	CERAMIC	470PF	10%	50V	
		< JACK >				
J301	1-770-306-11	JACK (LARGE TYPE) (PHONES) (BLACK)				
J301	1-770-307-11	JACK (LARGE TYPE) (PHONES) (Singapore: GOLD)				
		< COIL >				
L311	1-410-397-21	FERRITE BEAD INDUCTOR				
L312	1-410-397-21	FERRITE BEAD INDUCTOR				
L313	1-410-397-21	FERRITE BEAD INDUCTOR				
		< RESISTOR >				
R309	1-249-393-11	CARBON	10	5%	1/4W	
R310	1-249-393-11	CARBON	10	5%	1/4W	
		< VARIABLE RESISTOR >				
RV301	1-225-882-11	RES, VAR, CARBON 20K/20K (PHONE LEVEL)				

	1-679-722-11	LF BOARD (Singapore)				

		< CAPACITOR >				
△ C798	1-113-925-11	CERAMIC	0.01uF	20%	250V	
△ C799	1-113-925-11	CERAMIC	0.01uF	20%	250V	
		< CONNECTOR >				
* CN798	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P				
CN799	1-769-745-21	LEAD (WITH CONNECTOR) (2 CORE)				
		< LINE FILTER >				
△ LF798	1-411-547-11	FILTER, LINE				

Ref. No.	Part No.	Description	Remark			
	1-674-336-21	LOADING BOARD				

		< CONNECTOR >				
* CN1	1-568-943-11	PIN, CONNECTOR 5P				
		< SWITCH >				
S1	1-771-799-11	SWITCH, LEVER (SLIDE) (IN/OUT)				

	1-677-767-11	LP LED BOARD				

		< DIODE >				
D791	8-719-046-39	LED SEL5821A-TP15 (MDLP)				
		< RESISTOR >				
R791	1-247-807-31	CARBON	100	5%	1/4W	
		< SWITCH >				
S791	1-762-875-21	SWITCH, KEYBOARD (REC MODE)				

	A-4725-638-A	MAIN BOARD, COMPLETE (AEP, UK)				
	A-4725-645-A	MAIN BOARD, COMPLETE (US, Canadian)				
	A-4725-653-A	MAIN BOARD, COMPLETE (Singapore)				

	7-685-546-19	SCREW +BTP 3X8 TYPE2 N-S				
	7-685-871-01	SCREW +BVTT 3X6 (S)				
		< CAPACITOR >				
C100	1-128-551-11	ELECT	22uF	20%	25V	
C101	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C102	1-137-367-11	MYLAR	0.0033uF	5%	50V	
C103	1-137-365-11	MYLAR	0.0015uF	5%	50V	
C104	1-128-552-51	ELECT	47uF	20%	63V	
C105	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C106	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C107	1-128-551-11	ELECT	22uF	20%	25V	
C108	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C109	1-128-551-11	ELECT	22uF	20%	25V	
C200	1-128-551-11	ELECT	22uF	20%	25V	
C201	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C202	1-137-367-11	MYLAR	0.0033uF	5%	50V	
C203	1-137-365-11	MYLAR	0.0015uF	5%	50V	
C204	1-128-552-51	ELECT	47uF	20%	63V	
C205	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C206	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C207	1-128-551-11	ELECT	22uF	20%	25V	
C208	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C209	1-128-551-11	ELECT	22uF	20%	25V	
C300	1-126-933-11	ELECT	100uF	20%	16V	
C301	1-126-933-11	ELECT	100uF	20%	16V	
C302	1-165-319-11	CERAMIC CHIP	0.1uF		50V	
C303	1-165-319-11	CERAMIC CHIP	0.1uF		50V	
C304	1-165-319-11	CERAMIC CHIP	0.1uF		50V	
C308	1-216-295-11	SHORT	0			

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MAIN

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
C309	1-126-935-11	ELECT	470uF	20%	10V	C502	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C310	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C504	1-115-364-11	ELECT	22000uF	20%	16V
C311	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	C505	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C313	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C506	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C314	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C507	1-126-941-11	ELECT	470uF	20%	25V
C315	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	C508	1-126-941-11	ELECT	470uF	20%	25V
C316	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C509	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C317	1-126-934-11	ELECT	220uF	20%	10V	C510	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C318	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C511	1-126-916-11	ELECT	1000uF	20%	6.3V
C319	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C512	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C321	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C513	1-126-963-11	ELECT	4.7uF	20%	50V
C324	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C514	1-126-934-11	ELECT	220uF	20%	10V
C325	1-126-968-11	ELECT	100uF	20%	50V	C515	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C326	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C516	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C328	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C517	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C329	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C518	1-126-935-11	ELECT	470uF	20%	10V
C330	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C519	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C331	1-414-234-11	FERRITE	0uH			C520	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C333	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C521	1-126-963-11	ELECT	4.7uF	20%	50V
C334	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	C522	1-104-664-11	ELECT	47uF	20%	16V
C335	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C527	1-126-934-11	ELECT	220uF	20%	10V
C336	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	C528	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C337	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	C530	1-104-666-11	ELECT	220uF	20%	25V
C338	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C531	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C339	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C532	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C341	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C533	1-126-952-11	ELECT	1000uF	20%	35V
C345	1-126-933-11	ELECT	100uF	20%	16V	C534	1-126-966-11	ELECT	33uF	20%	50V
C346	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C535	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C350	1-126-933-11	ELECT	100uF	20%	16V	C536	1-128-576-11	ELECT	100uF	20%	63V
C351	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C537	1-126-935-11	ELECT	470uF	20%	10V
C352	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C538	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C353	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C539	1-126-960-11	ELECT	1uF	20%	50V
C358	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C540	1-126-960-11	ELECT	1uF	20%	50V
C362	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C541	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C363	1-126-933-11	ELECT	100uF	20%	16V	C542	1-126-936-11	ELECT	3300uF	20%	16V
C364	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C546	1-126-933-11	ELECT	100uF	20%	16V
C365	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C547	1-126-933-11	ELECT	100uF	20%	16V
C369	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C548	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C371	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C550	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C373	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C551	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C374	1-126-934-11	ELECT	220uF	20%	10V	C552	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C378	1-126-934-11	ELECT	220uF	20%	10V	C553	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C380	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C554	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C381	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C555	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C382	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C557	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C387	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C800	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C388	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C801	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C392	1-126-934-11	ELECT	220uF	20%	10V	C802	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C396	1-216-295-11	SHORT	0			C803	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C403	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C804	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C404	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C805	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C406	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C806	1-104-665-11	ELECT	100uF	20%	10V
C409	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C807	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C411	1-126-933-11	ELECT	100uF	20%	16V	C808	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C413	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C809	1-104-665-11	ELECT	100uF	20%	10V
C414	1-165-319-11	CERAMIC CHIP	0.1uF		50V	C811	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C500	1-126-926-11	ELECT	1000uF	20%	10V	C815	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C501	1-165-319-11	CERAMIC CHIP	0.1uF		50V						

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C818	1-165-319-11	CERAMIC CHIP	0.1uF	50V			
C819	1-104-665-11	ELECT	100uF	20%	10V		
C820	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
C821	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
C822	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
C823	1-165-319-11	CERAMIC CHIP	0.1uF	50V			
C827	1-126-791-11	ELECT	10uF	20%	16V		
C828	1-165-319-11	CERAMIC CHIP	0.1uF	50V			
C829	1-165-319-11	CERAMIC CHIP	0.1uF	50V			
C830	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
C842	1-165-319-11	CERAMIC CHIP	0.1uF	50V			
C850	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
C851	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
C852	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
C853	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
C860	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
C861	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		
< CONNECTOR >				< GROUND TERMINAL >			
CN300	1-506-468-11	PIN, CONNECTOR 3P		EP300	1-537-771-21	TERMINAL BOARD, GROUND	
* CN301	1-568-954-11	PIN, CONNECTOR 5P		EP501	1-537-771-21	TERMINAL BOARD, GROUND	
CN302	1-778-692-11	CONNECTOR, FFC/FPC 21P		< FERRITE BEAD >			
CN303	1-784-376-11	CONNECTOR, FFC/FPC 17P		FB304	1-216-295-11	SHORT	0
CN304	1-784-384-11	CONNECTOR, FFC/FPC 27P		< IC >			
CN305	1-793-990-11	CONNECTOR, FFC/FPC 18P		IC100	8-759-100-96	IC NJM4558M-TE2	
CN503	1-691-771-11	PLUG (MICRO CONNECTOR) 9P		IC200	8-759-100-96	IC NJM4558M-TE2	
CN504	1-506-469-11	PIN, CONNECTOR 4P		IC300	8-759-675-77	IC uDA1350AH	
CN505	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P		IC301	8-759-675-78	IC uDA1360TS	
< DIODE >				IC302	8-759-387-77	IC TC7WU04F-TE12L	
D100	8-719-800-76	DIODE 1SS226		IC303	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN)	
D200	8-719-800-76	DIODE 1SS226		IC304	8-759-710-97	IC NJM4565M (TE2)	
D300	8-719-801-78	DIODE 1SS184		IC305	8-759-100-96	IC NJM4558M-TE2	
D302	8-719-820-05	DIODE 1SS181		IC307	8-759-548-57	IC SN74LV00ANSR	
D303	8-719-820-05	DIODE 1SS181		IC400	8-759-633-65	IC M54641L	
D400	8-719-422-41	DIODE MA8051-L-TX		IC401	8-759-633-65	IC M54641L	
D501	8-719-200-02	DIODE 10E-2		IC500	8-759-678-77	IC LA5643	
D502	8-719-200-02	DIODE 10E-2		IC501	8-759-604-86	IC M5F7807L	
D503	8-719-200-02	DIODE 10E-2		IC502	8-759-656-35	IC NJM7810FA	
D504	8-719-200-02	DIODE 10E-2		IC504	8-759-633-42	IC M5293L	
D505	8-719-200-02	DIODE 10E-2		IC505	8-759-821-93	IC LA5601	
D506	8-719-200-02	DIODE 10E-2		IC506	8-759-592-79	IC BA00AST-V5	
D507	8-719-200-02	DIODE 10E-2		IC800	8-759-832-18	IC M30624MGA-A54FP	
D508	8-719-200-02	DIODE 10E-2		IC801	8-759-832-19	IC M30803MG-A01FP	
D509	8-719-423-07	DIODE MA8100-L-TX		< JACK >			
D510	8-719-200-02	DIODE 10E-2		J300	1-784-429-11	JACK, PIN 4P (ANALOG IN/OUT)	
D511	8-719-200-02	DIODE 10E-2		J302	1-580-394-11	CONNECTOR, DIN 6P (PC LINK)	
D512	8-719-200-02	DIODE 10E-2		< COIL >			
D513	8-719-200-02	DIODE 10E-2		L100	1-216-295-11	SHORT	0
D514	8-719-200-02	DIODE 10E-2		L200	1-216-295-11	SHORT	0
D516	8-719-421-18	DIODE MA8033-L		L300	1-216-295-11	SHORT	0
D519	8-719-975-40	DIODE RB411D		L301	1-216-295-11	SHORT	0
D520	8-719-975-40	DIODE RB411D		L302	1-216-295-11	SHORT	0
D521	8-719-975-40	DIODE RB411D		L303	1-216-295-11	SHORT	0
D522	8-719-975-40	DIODE RB411D		L304	1-216-295-11	SHORT	0
D523	8-719-074-34	DIODE RB495D-T146		L306	1-216-295-11	SHORT	0
D524	8-719-988-61	DIODE 1SS355TE-17		L307	1-216-295-11	SHORT	0
D526	8-719-988-61	DIODE 1SS355TE-17		L308	1-414-235-22	FERRITE	0uH
				L309	1-216-295-11	SHORT	0
				L310	1-414-235-22	FERRITE	0uH
				L315	1-216-295-11	SHORT	0
				L321	1-414-235-22	FERRITE	0uH
				L341	1-469-407-21	FERRITE	0uH
				L342	1-414-235-22	FERRITE	0uH
				L401	1-414-234-22	FERRITE	0uH
				< TRANSISTOR >			
				Q100	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO
				Q101	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO
				Q200	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO
				Q201	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO

MAIN

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
Q300	8-729-424-08	TRANSISTOR	UN2111			R315	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q301	8-729-421-22	TRANSISTOR	UN2211			△ R317	1-217-637-00	FUSIBLE	1	5%	1/4W
Q302	8-729-424-08	TRANSISTOR	UN2111			R320	1-216-025-11	RES-CHIP	100	5%	1/10W
Q400	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR			R321	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q401	8-729-421-22	TRANSISTOR	UN2211			R332	1-216-025-11	RES-CHIP	100	5%	1/10W
Q500	8-729-230-91	TRANSISTOR	2SC3113-B-TP			R333	1-216-025-11	RES-CHIP	100	5%	1/10W
Q501	8-729-421-22	TRANSISTOR	UN2211			R334	1-216-025-11	RES-CHIP	100	5%	1/10W
Q502	8-729-421-22	TRANSISTOR	UN2211			R340	1-216-025-11	RES-CHIP	100	5%	1/10W
Q503	8-729-194-57	TRANSISTOR	2SC945-P			R341	1-216-025-11	RES-CHIP	100	5%	1/10W
Q504	8-729-194-57	TRANSISTOR	2SC945-P			R342	1-216-025-11	RES-CHIP	100	5%	1/10W
< RESISTOR >						R344	1-216-025-11	RES-CHIP	100	5%	1/10W
R1	1-216-295-11	SHORT	0 (US, Canadian)			R345	1-216-295-11	SHORT	0		
R2	1-216-295-11	SHORT	0 (AEP, UK)			R346	1-216-025-11	RES-CHIP	100	5%	1/10W
R3	1-216-295-11	SHORT	0 (Singapore)			R349	1-216-025-11	RES-CHIP	100	5%	1/10W
R100	1-216-073-00	METAL CHIP	10K	5%	1/10W	R400	1-216-089-11	RES-CHIP	47K	5%	1/10W
R101	1-216-025-11	RES-CHIP	100	5%	1/10W	R401	1-216-081-00	METAL CHIP	22K	5%	1/10W
R102	1-216-049-11	RES-CHIP	1K	5%	1/10W	R402	1-216-081-00	METAL CHIP	22K	5%	1/10W
R103	1-216-653-11	METAL CHIP	1.2K	0.5%	1/10W	R500	1-216-097-11	RES-CHIP	100K	5%	1/10W
R104	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R501	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R105	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	R502	1-216-040-00	RES-CHIP	430	5%	1/10W
R106	1-216-097-11	RES-CHIP	100K	5%	1/10W	R503	1-216-044-00	METAL CHIP	620	5%	1/10W
R107	1-216-045-00	METAL CHIP	680	5%	1/10W	R504	1-216-089-11	RES-CHIP	47K	5%	1/10W
R108	1-216-037-00	METAL CHIP	330	5%	1/10W	R505	1-216-073-00	METAL CHIP	10K	5%	1/10W
R109	1-216-049-11	RES-CHIP	1K	5%	1/10W	R506	1-216-025-11	RES-CHIP	100	5%	1/10W
R110	1-216-017-00	RES-CHIP	47	5%	1/10W	R507	1-216-097-11	RES-CHIP	100K	5%	1/10W
R111	1-216-017-00	RES-CHIP	47	5%	1/10W	R508	1-216-083-00	METAL CHIP	27K	5%	1/10W
R112	1-216-079-00	METAL CHIP	18K	5%	1/10W	R509	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R113	1-216-084-00	METAL CHIP	30K	5%	1/10W	R510	1-216-073-00	METAL CHIP	10K	5%	1/10W
R114	1-216-017-00	RES-CHIP	47	5%	1/10W	R513	1-216-049-11	RES-CHIP	1K	5%	1/10W
R115	1-216-105-00	RES-CHIP	220K	5%	1/10W	R514	1-216-049-11	RES-CHIP	1K	5%	1/10W
R116	1-216-049-11	RES-CHIP	1K	5%	1/10W	R516	1-216-033-00	METAL CHIP	220	5%	1/10W
R200	1-216-073-00	METAL CHIP	10K	5%	1/10W	R518	1-216-054-00	RES-CHIP	1.6K	5%	1/10W
R201	1-216-025-11	RES-CHIP	100	5%	1/10W	R519	1-216-039-00	METAL CHIP	390	5%	1/10W
R202	1-216-049-11	RES-CHIP	1K	5%	1/10W	R520	1-216-054-00	RES-CHIP	1.6K	5%	1/10W
R203	1-216-653-11	METAL CHIP	1.2K	0.5%	1/10W	R521	1-216-039-00	METAL CHIP	390	5%	1/10W
R204	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R522	1-216-097-11	RES-CHIP	100K	5%	1/10W
R205	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	R550	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R206	1-216-097-11	RES-CHIP	100K	5%	1/10W	R551	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R207	1-216-045-00	METAL CHIP	680	5%	1/10W	R800	1-216-073-00	METAL CHIP	10K	5%	1/10W
R208	1-216-037-00	METAL CHIP	330	5%	1/10W	R801	1-216-073-00	METAL CHIP	10K	5%	1/10W
R209	1-216-049-11	RES-CHIP	1K	5%	1/10W	R802	1-216-073-00	METAL CHIP	10K	5%	1/10W
R210	1-216-017-00	RES-CHIP	47	5%	1/10W	R806	1-216-073-00	METAL CHIP	10K	5%	1/10W
R211	1-216-017-00	RES-CHIP	47	5%	1/10W	R807	1-216-073-00	METAL CHIP	10K	5%	1/10W
R212	1-216-079-00	METAL CHIP	18K	5%	1/10W	R809	1-216-097-11	RES-CHIP	100K	5%	1/10W
R213	1-216-084-00	METAL CHIP	30K	5%	1/10W	R810	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R214	1-216-017-00	RES-CHIP	47	5%	1/10W	R811	1-216-073-00	METAL CHIP	10K	5%	1/10W
R215	1-216-105-00	RES-CHIP	220K	5%	1/10W	R812	1-216-073-00	METAL CHIP	10K	5%	1/10W
R216	1-216-049-11	RES-CHIP	1K	5%	1/10W	R814	1-216-073-00	METAL CHIP	10K	5%	1/10W
△ R300	1-219-786-11	FUSIBLE	22	5%	1/4W	R830	1-216-073-00	METAL CHIP	10K	5%	1/10W
△ R301	1-219-786-11	FUSIBLE	22	5%	1/4W	R833	1-216-295-11	SHORT	0		
R302	1-216-101-00	METAL CHIP	150K	5%	1/10W	R838	1-216-295-11	SHORT	0		
R303	1-216-025-11	RES-CHIP	100	5%	1/10W	R839	1-216-295-11	SHORT	0		
R304	1-216-025-11	RES-CHIP	100	5%	1/10W	R850	1-216-073-00	METAL CHIP	10K	5%	1/10W
R306	1-216-025-11	RES-CHIP	100	5%	1/10W	R852	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R312	1-216-025-11	RES-CHIP	100	5%	1/10W	R855	1-216-073-00	METAL CHIP	10K	5%	1/10W
R314	1-216-073-00	METAL CHIP	10K	5%	1/10W	R860	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
						R861	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
						R870	1-216-025-11	RES-CHIP	100	5%	1/10W

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MAIN						TRANS			TRANS (SP)			PW SW		
Ref. No.	Part No.	Description				Remark	Ref. No.	Part No.	Description				Remark	
R871	1-216-025-11	RES-CHIP	100	5%	1/10W			< RELAY >						
R872	1-216-025-11	RES-CHIP	100	5%	1/10W									
R873	1-216-025-11	RES-CHIP	100	5%	1/10W									
< COMPOSITION CIRCUIT BLOCK >														
RB803	1-236-908-11	NETWORK RESISTOR (CHIP) 10Kx4												
RB804	1-236-908-11	NETWORK RESISTOR (CHIP) 10Kx4												
RB805	1-233-414-11	RES, CHIP NETWORK 4.7Kx4 (3216)												
RB806	1-236-908-11	NETWORK RESISTOR (CHIP) 10Kx4												
RB810	1-233-414-11	RES, CHIP NETWORK 4.7Kx4 (3216)												
< VARIABLE RESISTOR >														
RV500	1-225-895-21	RES, ADJ, CERMET (3 TYPE) 1K												
< VIBRATOR >														
X800	1-579-930-12	VIBRATOR, CERAMIC (16MHz)												
X801	1-795-004-21	VIBRATOR, CERAMIC (10MHz)												

	1-677-769-11	TRANS BOARD (EXCEPT Singapore)												

< CAPACITOR >														
△ C651	1-113-920-11	CERAMIC	0.0022uF	20%	250V									
△ C652	1-113-925-11	CERAMIC	0.01uF	20%	250V									
△ C653	1-113-925-11	CERAMIC	0.01uF	20%	250V									
< CONNECTOR >														
CN652	1-564-321-00	PIN, CONNECTOR 2P												
< DIODE >														
D651	8-719-200-22	DIODE 11E2FA-9												
< LINE FILTER >														
△ LF651	1-411-547-11	FILTER, LINE												
< RELAY >														
△ RY650	1-755-299-11	RELAY												
< TRANSFORMER >														
△ T652	1-433-666-11	TRANSFORMER, POWER (US, Canadian)												
△ T652	1-433-668-11	TRANSFORMER, POWER (AEP, UK)												

	1-679-008-11	TRANS (SP) BOARD (Singapore)												

< CAPACITOR >														
△ C601	1-113-920-11	CERAMIC	0.0022uF	20%	250V									
< CONNECTOR >														
CN602	1-564-321-00	PIN, CONNECTOR 2P												
< DIODE >														
△ D600	8-719-200-22	DIODE 11E2FA-9												

MXD-D40

Ref. No.	Part No.	Description	Remark
M103	A-4672-975-A	MOTOR ASSY, LOADING (for MD)	
M702	A-4672-771-A	MOTOR (LD) ASSY (LOADING) (for CD)	
S102	1-771-957-11	SWITCH, PUSH (2 KEY) (REFLECT RATE DETECT, PROTECT DETECT)	
⚠ T601	1-435-650-11	TRANSFORMER, POWER (Singapore)	
⚠ T651	1-435-648-11	TRANSFORMER, POWER (US, Canadian)	
⚠ T651	1-435-649-11	TRANSFORMER, POWER (AEP, UK)	

HARDWARE LIST

#1	7-685-204-19	SCREW +KTP 2X6 TYPE2 NON-SLIT
#2	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
#3	7-685-871-01	SCREW +BVTT 3X6 (S)
#4	7-685-850-04	SCREW +BVTT 2X3 (S)
#5	7-685-646-79	SCREW +BVTP 3X8 TYPE2 TT (B)

ACCESSORIES & PACKING MATERIALS

⚠	1-476-045-11	REMOTE COMMANDER (RM-D43M)
	1-766-263-11	CORD, CONNECTION (AUDIO)
	1-569-008-21	ADAPTOR, CONVERSION 2P (Singapore)
	4-229-644-11	MANUAL, INSTRUCTION (ENGLISH)
	4-229-644-21	MANUAL, INSTRUCTION (FRENCH) (Canadian, AEP, Singapore)
	4-229-644-31	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE) (AEP, Singapore)
	4-229-644-41	MANUAL, INSTRUCTION (GERMAN, DUTCH) (AEP)
	4-229-644-51	MANUAL, INSTRUCTION (SWEDISH, ITALIAN) (AEP)
	4-229-644-61	MANUA, INSTRUCTION (TRADITIONAL CHINESE) (Singapore)
	4-981-643-01	COVER, BATTERY (for RM-D43M)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
--	--